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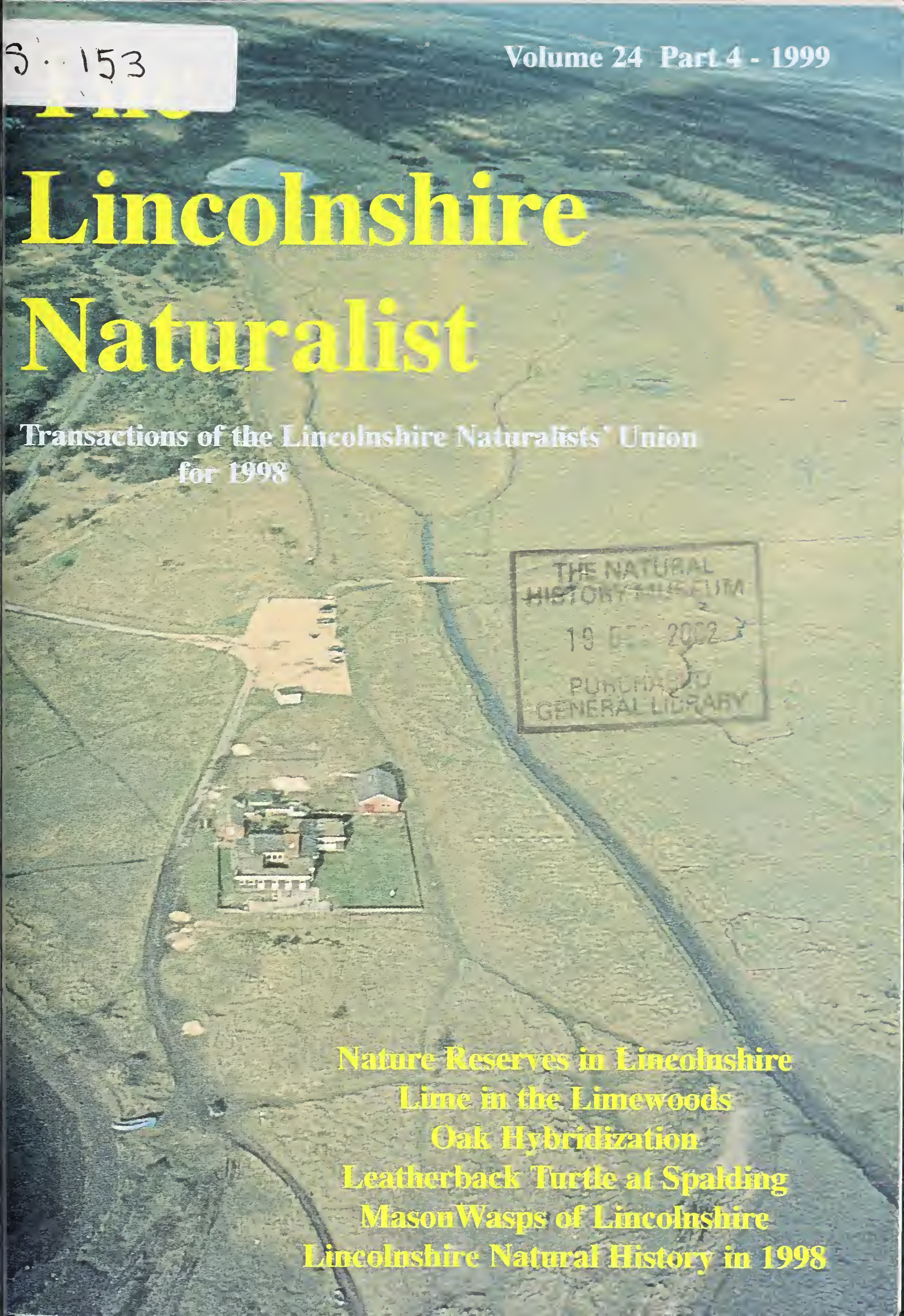

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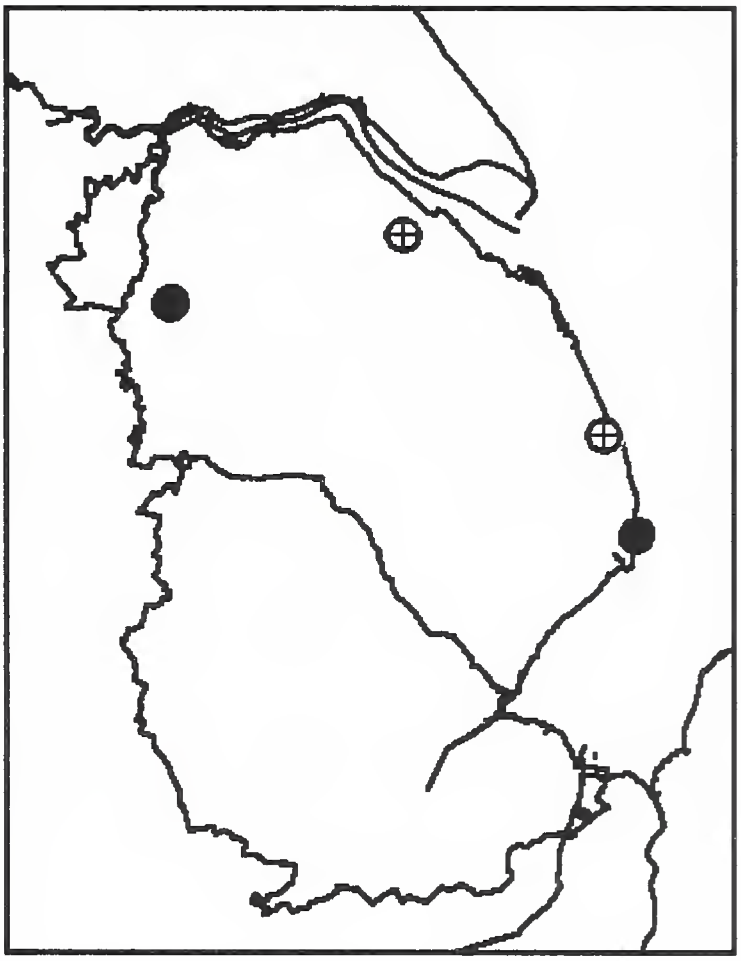
NATURE RESERVES IN LINCOLNSHIRE - THEIR FUNCTIONS AND VALUES

Ted Smith

The National Background

A place reserved for nature is a relatively recent concept. Early moves to protect wildlife concentrated on promoting legislation to stop over-collecting and cruelty and on educational campaigns to assist enforcement. That was the primary aim of the RSPB when it was founded in 1889 and, when the National Trust was founded in 1894, its objectives and its full title included the protection of natural beauty as well as historic interest. However, wildlife conservation did not figure prominently in the policies and practices of its early years. To redress the balance was one of the motives of Charles Rothschild in establishing the Society for the Promotion of Nature Reserves in 1912. Any nature reserves which the Society was able to secure were to be put into the guardianship of the National Trust, and that happened in two or three cases such as Wicken Fen and Blakeney Point. Rothschild's other aim was to persuade government to become involved in nature conservation and, partly with this in mind, he published in 1915 the first list of potential nature reserves in the United Kingdom, the result of a countrywide survey (fig 1) (Society for the Promotion of Nature Reserves, 1915).



● site now a nature reserve

⊕ site now destroyed or interest lost

Fig 1. The 1915 Rothschild/SPNR potential reserves in Lincolnshire (SPNR, 1915).

In spite of Rothschild's efforts, nature reserve establishment made little headway in the inter-war years. His hopes of government action foundered in the financial stringency which followed the First World War and his own illness and early death in 1923 left the SPNR leaderless and ineffective. The National Trust, then never very enthusiastic about nature conservation, found the costs of effectively managing places like Wicken Fen beyond its means. The SPNR, forced to retain and manage its Woodwalton Fen property after the National Trust declined it, struggled in vain with inadequate resources to prevent the Fen from reverting to scrub and woodland. Throughout the 1920s and 30s, interest in nature conservation, such as it was, was still concentrated on controlling practices such as egg-collecting, bird catching and the uprooting of wild plants. Even the RSPB, with a membership of more than 4,000 by the mid thirties, still devoted most of its resources to employing 'watchers' to protect rare species by agreement with landowners, rather than purchasing sanctuaries. Policies and practices were, however, about to change.

There was, it is true, comparatively little cause for concern about the effects of farming on wildlife in the inter-war years. Continuing depression ensured that there was no drastic change. The increasing use of tractors and bigger machinery perhaps foreshadowed what was to come, but the Enclosure landscape of the nineteenth century was still largely intact if somewhat decayed. Farming may have remained relatively low-key, but the same could not be said for forestry. The Forestry Commission, created in 1918 to ensure self-sufficiency in timber in the event of another war, was busy planting up heathland and moorland. By 1940, much of the Coversands heaths of north-west Lincolnshire had been blanketed by alien conifers.

The principal conservation concern in those inter-war years, however, was industrial and building development coupled with the growth of motor transport. Population was increasing, towns expanding and coastlines being taken over by holiday bungalows and chalets, the latter a development which so alarmed Lindsey County Council that they promoted an act of parliament in 1932, the Lindsey Sandhills Act, to enable them to control the development of the coastal sandhills, by purchase if necessary. It was a unique piece of legislation in Britain and one of great importance for the future of nature conservation in the county. Industrial encroachment on the countryside, however, was not a major problem in Lincolnshire in the 1930s, except in the north-west around Scunthorpe, where ironstone mining was destroying some of the best areas of heathland.

With the outbreak of the Second World War and the threat to our food supplies from abroad, agriculture entered a more intensive phase. Grasslands were ploughed up and marshes drained on an unprecedented scale with no regard to their wildlife interest. Paradoxically it was the destruction of so much habitat by industrial and other developments and then by more intensive agriculture that aroused a new interest in the concept of nature reserves. It became increasingly apparent that, in future, special places would have to receive special protection and management if they were to survive.

The value of nature reserves was also strongly advocated by professional ecologists who were a powerful influence on the development of modern nature conservation. In his book *Our Heritage of Wild Nature,* Professor Sir Arthur Tansley gave three reasons for establishing reserves: “first there is their natural beauty and the deep sentiment which attaches to them as wild country in which one can escape from the strains of modern life; secondly there is their scientific value which has also economic implications; and thirdly their value as instruments of education in the widest sense” (Tansley, 1945) .The outdoor laboratory and living museum concept was gaining ground.

Planning for peace “for greater prosperity and security for all classes and for a better environment” began when the war was little more than a year old. Foremost among issues was the use of the land and its resources. Within that context, the SPNR came back to life and organised a conference in 1941 on Nature Preservation in Post-War Reconstruction. One result of that was the creation of the Nature Reserves Investigation Committee (NRIC) which first published a memorandum (Nature Reserves Investigation Committee, 1945) setting out the reasons for conserving sites and areas of key importance for their ‘biology, zoology, geology, mineralogy and ecology’. The Committee then decided to undertake a survey of potential nature reserves throughout the country and for that purpose set up county and regional sub-committees. A Lincolnshire sub-committee appointed by the LNU prepared a list of sites which was submitted to the NRIC in 1944. Tom Baker was the secretary and I was one of the members.

Somewhat disappointingly, no Lincolnshire site appeared in the NRIC’s selection of forty-seven potential National Reserves in their report; the county was still largely unknown to those ecologists and naturalists who made up the national committee. The same was true of the government’s own Wildlife Conservation Special Committee which followed hard on the heels of the NRIC. Of the seventy-three NNRs which it proposed in England (Huxley & Tansley, 1947) only a small part of one area, the Holywell and Pickworth Woods, was in Lincolnshire. That proposed national reserve never materialised, but a remnant of it is the Trust's recently restored limestone grassland at Robert's Field.

Both the NRIC and the WCSC recognised that there were hundreds more sites, many of them recommended by the NRIC sub-committees, which were worthy of protection. In order that those sites should be officially recognised, the WCSC recommended that they be scheduled as Sites of Special Scientific Interest and reported to the local planning authorities which had been created by the Town and Country Planning Act of 1947. Provision for SSSIs was subsequently included in the nature conservation provisions of the National Parks and Access to the Countryside Act of 1949 and the task of scheduling was given to the Nature Conservancy, also established in that year. Until they were strengthened thirty years later, the SSSI provisions, whilst a welcome recognition of the value of local sites, proved to be pathetically inadequate to protect them, largely because agricultural and forestry operations were outside planning control.

Both the national committees stressed the importance of local action in creating nature reserves and they advocated powers for local authorities for the purpose, a provision subsequently included in the 1949 Act and, incidentally, used for the first time in England by Lindsey County Council in declaring the Gibraltar Point Reserve (cover plate) in 1952. The role of natural history societies, they envisaged, would be to advise local authorities, carry out surveys and undertake some of the management. In fact, with some notable exceptions, like Lindsey County Council, local authorities showed little interest in nature conservation or in spending money on acquiring nature reserves. Only forty such reserves were declared in the UK in the first twenty-five years of the powers becoming available.

It was just as well therefore that the movement to form County Naturalists' Trusts gathered momentum in the 1950s. Our own Trust, founded in 1948 and only the third in England after Norfolk (1926) and Yorkshire (1946), was very much in the vanguard of the movement. The first Trusts' conference, which it organised and hosted at Skegness in 1960, was a landmark event. In the following five years almost the whole of the country was covered by county or regional trusts, one of whose principal aims was the establishment and management of nature reserves.

Selecting Lincolnshire's nature reserves

Unlike the reports of the NRIC and WCSC, Charles Rothschild's 1915 list of potential nature reserves (Society for the Promotion of Nature Reserves, 1915) did include four sites in Lincolnshire (fig 1, table 1). These are described in the book *Rothschild's Reserves – Time and Fragile Nature* by Rothschild's daughter, Doctor Miriam Rothschild, and Peter Marren (Rothschild & Marren, 1997). The authors' purpose was to trace what has happened to the 182 sites in the 1915 list. Overall, not surprisingly, they found that more than half of them had been destroyed or severely damaged. The Lincolnshire sites in the list were no exception. Most of the heathland of Scotton Common had become a conifer plantation in the 1920s and 30s; Freshney Bog, an outstandingly important site (which, incidentally, the LNU made unsuccessful attempts to save in the 1930s) was used as a municipal rubbish tip in the 1940s (the present nature reserve there is not in the original site). The shallow Outmarsh pasture dykes at Huttoft, selected as a site for *Iris spuria,* became eutrophicated ditches when the pastures were converted to arable in the 1950s and 60s. Only the Gibraltar Point sand-dunes have survived relatively intact, although dunes north of Skegness, which Rothschild included, have been lost to erosion, urban development and a golf course.

It has to be said that the Rothschild list, whilst a remarkable achievement, was based on very erratic survey coverage depending, in many cases, on a single naturalist. For Lincolnshire this was Miss Florence Woolward of Belton near Grantham. It was also heavily biassed to certain parts of the country and towards invertebrate groups. "Highly subjective" was how Rothschild and Marren described it in their recent book.

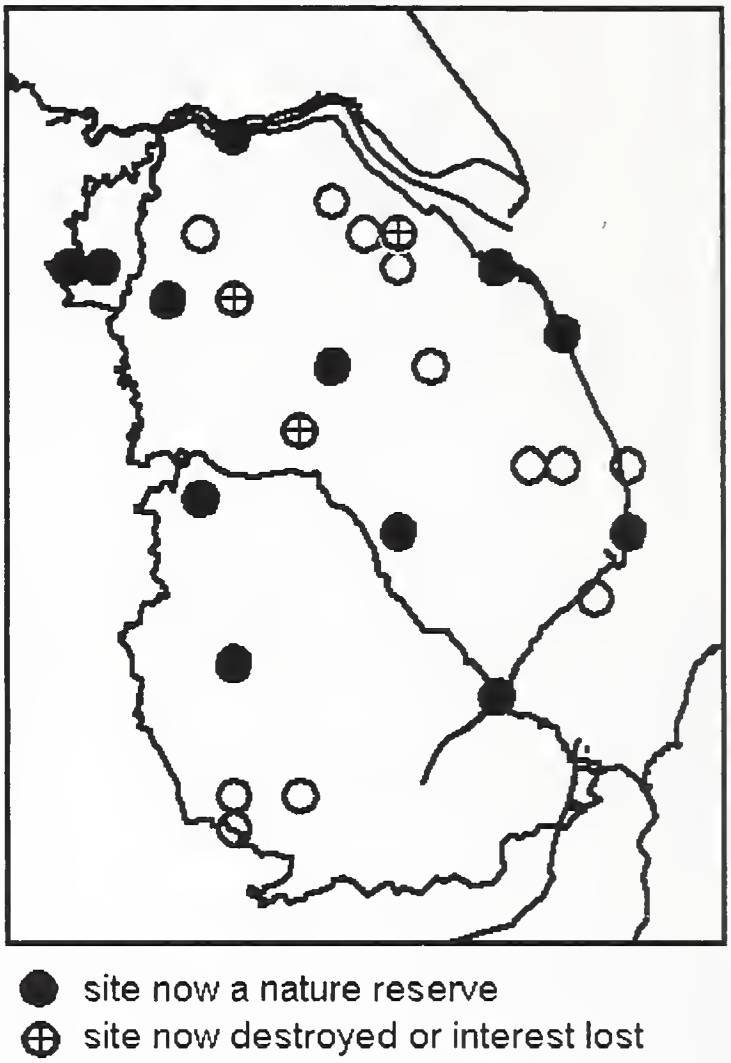

● site now a nature reserve
⊕ site now destroyed or interest lost

Fig. 2. 1944 NRIC Lincs subcommitte list of potential reserves

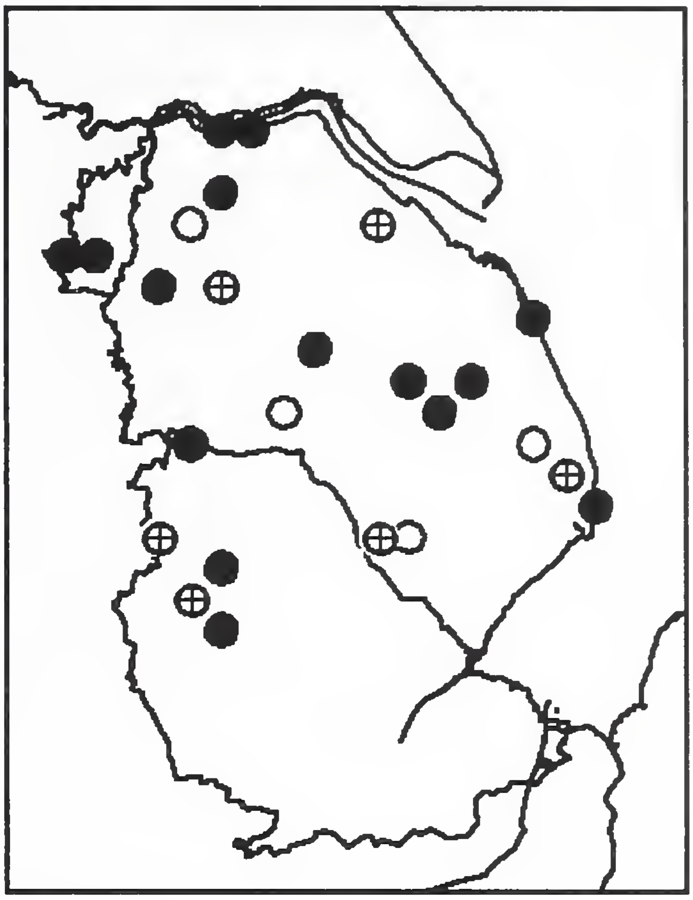
The NRIC sub-committees were asked to identify potential reserves under the classification of habitat, species, amenity and education (fig 2, table 1); what were called scheduled areas being larger tracts of countryside or coast, and areas in public control. The Lincolnshire sub-committee identified the last two categories respectively as the coastline and the main Forestry Commission properties – Bourne Woods, Scotton Common (Laughton Forest), and Twyford Forest. They concentrated their recommendations on habitat reserves to ensure, as they put it, "that future progress in agriculture and afforestation will not cause serious losses of natural habitat". That proved a somewhat forlorn hope. They chose examples of characteristic Lincolnshire habitats to provide 'reservoirs' (it is interesting that the 'reservoir' concept was already recognised in 1944) for the associated communities of flora and fauna and to serve "for ecological studies and local investigation". They made no specific recommendation for reserves for species, believing that species protection would best be provided in habitat reserves. As for amenity, they named Hartsholme, Tetney/ Humberston and Croxby/Hatcliffe, but observed that amenity areas needed further study in consultation with local authorities.

The habitat list comprised 25 areas, some of them large and only broadly defined. The main interest in each case was very briefly described. Of those sites capable of individual definition, some of them within larger areas, eleven have since become nature reserves and six have been destroyed or lost most of their interest (table 1). Some of the others are large woodlands in private ownership like Brocklesby, Holywell and Newell, and Welton, or vaguely defined areas in the Wolds like Croxby/Hatcliffe or Welton-le-Wold. One particularly interesting feature of the list was the selection of those reserves with potential for education. Seventeen are named and the distance from the nearest town was given.

The NRIC sub-committees were given a very tight timetable in which to complete their work and, inevitably, selection of sites was based almost entirely on existing knowledge. There was little or no opportunity for new survey or investigation which, in the middle of the war, would in any case have been difficult. It is notable nevertheless that more than half the sites continued to feature in later lists, including eventually the SSSI schedules.

A reserve acquisition policy and programme was one of the first requirements of the

Lincolnshire Trust when it came into being in 1948. The selection of potential reserves had to satisfy a number of criteria. First, it would have to take account of Lincolnshire's range of ecosystems and remarkable biogeographical diversity and include representative examples of the main habitats in the county then recognised as in need of protection: heathland, peat bog, chalk and limestone grassland, wetlands, coastlands and woodlands. Secondly, it would have to have regard to the needs of rare and endangered species, and thirdly it would have to take account of the degree of threat to particular sites.



● site now a nature reserve

⊕ site now destroyed or interest lost

Fig 3. 1950 Lincolnshire Naturalists' Trust list of potential reserves

It so happened that the Trust's requirement for a new 'shopping list' in 1949 coincided with the responsibility placed on the newly created Nature Conservancy to produce schedules of SSSIs for each county and county borough. With only a very small headquarters staff and no regional structure at that time, the Conservancy had to look for outside help and, in Lincolnshire, it contracted with the Trust for the results of the new survey. The majority of the sites covered by that survey in 1950 (fig 3, table 1) had appeared in the NRIC sub-committee list. The amount of new investigation was necessarily very limited, but Dick Cornwallis and I personally visited almost all the sites selected and gathered much new information about their habitat and species interest, about their use and condition and their ownership. We also made recommendations about means of securing their protection and appropriate management. Twenty-six sites appear in the list (table 2). Two of them, Epworth and Haxey Turbaries, represented peatland habitats. Five, Manton/Twigmoor, Scotton Common, Linwood Warren and Stapleford Moor were heathland, five were calcareous grassland and scrub, Tetford Hill, Red Hill, Copper Hill, Ancaster Valley and High Dyke. Six were woodlands, Skellingthorpe, Troy, Welton, Muckton, Stainton and Broughton Far Wood and four were wetlands, Freshney Bog (although already virtually destroyed), Barton Pits, Woodhall/Tattershall Gravel Pits and Orby South Drain, and four were coastal; Gibraltar Point, Saltfleetby/Theddlethorpe, Freiston Shore and Reads Island.

Twelve of the twenty-six subsequently became nature reserves. Seven were totally destroyed or lost most of their interest through damage or neglect, including the irreplaceable sites of Waddingham Common and Freshney Bog, with which rare plants like the grass of Parnassus *Parnassia palustris* and animals like the rare leaf beetle *Cryptocephalus exiguus* were lost to the county.

By present-day standards, the 1950 list (and the first SSSI schedules for that matter) may seem very inadequate, but it represented the best part of our knowledge of the county's wildlife sites at that time and it certainly highlighted those which were under imminent threat. There were, you will notice, no hay meadows in the list or the schedules. The reason was that they were still sufficiently abundant in 1950 not to cause concern. It is

Table 1 Three early lists of potential nature reserves in Lincolnshire

Rothschild's SPNR list 1915	NRIC Lincolnshire sub-committee list 1944	1950 Lincolnshire Naturalists' Trust list
Freshney Bog	*Freshney Bog*	*Freshney Bog*
Scotton Common	***Scotton Common***	***Scotton Common*** (part)
Skegness Sand-Dunes (including Gibraltar Point)	**Gibraltar Point**	**Gibraltar Point**
	Ancaster Area	**Ancaster Copper Hill & Valley**
	Haxey/Epworth Turbaries	**Haxey/Epworth Turbaries**
	Linwood/Legsby Area	**Linwood Warren**
	Read's Island	**Read's Island**
	Theddlethorpe Coast	**Saltfleetby/Theddlethorpe Dunes**
	Twigmoor Gull Ponds & Woods	Manton and Twigmoor area
	Waddingham Common	*Waddingham Common*
	Welton Wood	Welton Wood
Huttoft Dykes	Bourne Woods	**Barton Pits and Quarries**
	Brocklesby Woodlands	**Broughton Far Wood**
	Croxby/Hatcliffe Area	Coningsby Troy Wood
	Hartsholme (Amenity Reserve)	*Frieston Shore*
	Holywell and Newell Woods	**Leadenham High Dyke**
	Huttoft/Chapel St Leonards Coast	**Muckton Wood**
		Orby Marsh South Drain
	Frampton/Kirton Marshes	**Skellingthorpe Wood**
	Friskney Flats	Stainton Wood
	Irby Dale	*Stapleford Moor*
	Newball Wood	**Stenigot Red Hill**
	Tetney/Humberston Coast	*Tattershall/Woodhall Gravel Pits*
	Twyford Forest	**Tetford Hill**
	Welton-Le-Wold	
	Well Vale	
	Woodhall Spa – Kirkby Moor	

bold - Now a nature reserve in whole or part
italic - subsequently destroyed or lost interest in whole or part

perhaps surprising that we did not include Kirkby or Roughton Moors as examples of Fen edge heathland, but we concentrated on sites for which at that time we had adequate information and which we could thereby justify to the Nature Conservancy for SSSI designation. Knowledge of the general ecological interest of woodlands was still sketchy and the national importance of the Bardney Forest limewoods still unrecognised. Wetlands created from sand and gravel workings had only just begun to develop on a large scale. One important site, Roberts Field at Holywell, was deliberately omitted from the list because it was still scheduled by the Nature Conservancy as a proposed NNR. The Conservancy's subsequent delay in deciding to drop the proposal was a contributing factor in the failure to prevent afforestation of the site in the 1960s. Whatever the inadequacies of the list, it was, for the new Trust with only the slenderest of resources, enough to be going on with. It also linked its acquisition policies closely to the SSSIs which have ever since received its highest priority.

Progress in nature reserve acquisition: 1948 – 1970

The Trust moved swiftly in its early years to try to safeguard the sites on the list, giving priority to those on the coast and on the north-west heaths which were perceived to be the most immediately under threat. The conclusion of an agreement with Lindsey County

Council to create the Gibraltar Point Nature Reserve coincided with the formal birth of the Trust in December 1948. It is scarcely possible to exaggerate the importance of that event in the development of the Trust or indeed of nature conservation in Lincolnshire and beyond. Use of the reserve for education, research and public enjoyment of nature, as well as for the conservation of its wildlife and natural features, was a new concept clearly defined in the report of the Wildlife Conservation Special Committee. Gibraltar Point was a pioneering model of that concept and the experience of managing it was, I believe, one of the reasons why the Trust was able to take a lead in the promotion of the Trust movement country-wide. Over the years, the Gibraltar Point reserve has been secured. The defeat of a caravan camp proposal there in 1952 was the first major planning battle for a nature reserve in the country. It has recently been further enlarged by the Trust's acquisition of forty acres of sand-dune and freshwater marsh and of the former arable field now known as Jackson's Marsh which is being converted to wetland habitats.

Further planning battles were necessary to safeguard the other main sand-dune area between Saltfleetby and Theddlethorpe. The Trust had secured a licence from the Ministry of Defence (it was then an active bombing range) in 1956 to manage the dunes, but the area was soon threatened by a caravan camp proposal and the expansion of an existing site. The threats were warded off by planning action involving public inquiries and, when the MoD released a large part of the area in 1968, the Nature Conservancy agreed to take it over under the government disposal of land procedures then operating. Thus the Saltfleetby-Theddlethorpe dunes National Nature Reserve was created.

Heathland was the other area of early concern. The remnants that had survived in the north-west, about 12% of what there had been in 1870, were still in danger and the Trust's purchase of the tract of wet heath on the edge of Scotton Common in 1953 almost certainly saved it from afforestation or use as a chicken farm. The price of £400 for thirty acres sounds paltry by today's values, but it was the market price and the Trust's income in that year was only £203. It was a grant of £200 from the SPNR that enabled the deal to be completed. With the acquisition of Linwood Warren in 1957 and of the Epworth and Haxey Turbaries in 1958, four of the important heath and bog areas in the 1944 and 1950 lists were thus secured, although the problems of managing habitats so prone to rapid vegetation succession, aggravated by falling water tables, took many years to overcome.

Two other heathland sites in the lists, Waddingham Common, to which I have already referred, and Manton Common were lost to agricultural reclamation in spite of very strenuous efforts made to save them. Waddingham, a turf bog over the limestone, was a particularly grievous loss. It was a unique habitat in Lincolnshire with an extraordinarily rich assemblage of calcicole and calcifuge species. Its destruction became a national *cause celebre* and helped speed up the strengthening of legislative protection for SSSIs. Another heathland site, a notable omission from the 1944 and 50s lists, was Messingham Heath. The northern part of it, with its sand dunes and wet hollows, was possibly the best example of the low-lying Coversands heaths. It was destroyed by sand and gravel extraction in the 1960s, again in spite of its SSSI status and Trust and Nature Conservancy efforts to save it. The remaining heathland fragment of Trent Valley gravels at Stapleford Moor was little more than a clearing in a dense conifer plantation. Although the Trust secured an agreement about it with the Forestry Commission, it was doomed to disappear as the conifers grew and shaded it out completely.

Of the calcareous grassland sites in the 1950 list, the Red Hill was established as a reserve in 1967, following tortuous negotiations involving the County Council, the Parish Council and the owner of the Manor Farm. An informal agreement with the owner of Ancaster Valley was concluded in the late 1960s and led eventually to its acquisition in

1982. The High Dyke verges came under the protected road verge agreement between the Trust and the County Council first concluded in 1960 and subsequently strengthened. The same applied to the verges at Tetford Hill and Copper Hill near Ancaster.

Of the woodlands, Muckton was spared conversion to conifers by agreement between the Trust and the Forestry Commission, and some 65% of it was acquired by the Trust in 1983. A limited agreement was also concluded with the Forestry Commission to retain the character of rides in Skellingthorpe Wood, one of the last localities of the chequered skipper butterfly. Lack of proper management, however, led to their deterioration. Skellingthorpe Wood was acquired by the Woodland Trust a few years ago and its gradual restoration to largely broad-leaved woodland is planned.

In the late 1950s the Trust made an attempt to purchase part of the Barton Pits complex, another site on the 1950 list, but the negotiations failed. Another twenty years were to pass before successful efforts to safeguard this area could be made.

By 1970 eleven of the sites on the 1950 list had been secured as reserves and unsuccessful efforts had been made to prevent the destruction or deterioration of four more.

Factors affecting reserve acquisition

The limitations of the 1950 list, however, were always acknowledged. Its eventual expansion was in fact foreshadowed by the appending to it of a supplementary list of sites and, in any case, new developments after 1960 necessitated a radical re-appraisal of nature reserve selection. First, there was the drastic intensification of farming methods and practices, the full extent of which few people had foreseen in the immediate post-war period. Waddingham Common, Manton Common and Worlaby Meadows, a newly discovered site of national importance, were notable victims of it, but its most widespread consequence was the wholesale loss of permanent grass, in particular the once abundant hay meadows. As I have already observed, scarcely any of those occur in early SSSI schedules for lowland counties in England but, by the 1960s, the Trust had had to mount an emergency operation to salvage even a small selection of them in Lincolnshire. The result can be seen in the fine series of meadow reserves including those at Bratoft (plate 5), Sotby, Kingerby, Hatton, Willoughby, Goulceby, Ancaster, Little Scrubs, Rush Furlong in the Isle of Axholme, Porter's Lodge at North Witham and those adjoining Lawn Wood at Castle Bytham. They are a large proportion of the less than 1% of herb-rich meadows which have survived in Lincolnshire.

More intensive land drainage spelt the end of many river valley marshes and wet pastures. Construction of the Coronation Channel around Spalding in the early 1950s dried out the Crowland and Cowbit Washes which, in nature conservation terms, were comparable with those which have survived on the Nene and Ouse. The Trust was fortunate to acquire the remaining example of washland in Lincolnshire at Baston Fen (plate 3) on the River Glen.

Increasing knowledge of sites and distribution of species also influenced reserve selection from the 1960s onwards. Naturalists' records and observations had always been the main source of information but these had become more focussed in the search for interesting sites for conservation purposes in surveys like that of ancient woodlands, and in the compilation of species distribution atlases like the BSBI's ground-breaking *Atlas of the British Flora* (Perring & Walters, 1962).

Teams working under the government's Community Programme, consisting mainly of graduates, discovered more new sites in the 1970s and helped to develop a quality grading system. The strengthening of the survey capacity of the Nature Conservancy and its successor bodies, both at regional and national level, was also of great importance. The review of reserves and sites and the preliminary survey of Lincolnshire grasslands conducted by John Blackwood of the Conservancy (Blackwood, 1968), the more thorough survey of chalk grassland in 1988, and the more recent inventories of heathland, (English Nature/RSPB, 1994,1996), grassland (English Nature 1995a&b) ancient woodland (Hughes, 1988; Spencer, 1989) and sites for invertebrates (Key, 1986; Kirby, 1987) are just some of the examples from which new information about site selection was derived.

The massive classification of sites of nature conservation importance in Britain undertaken by the Nature Conservancy Council and published in 1977 (Ratcliffe 1977), provided further stimulation and guidance in selection of sites of national and local importance in the county. It also confirmed the scientific validity of the acquisition policies which the Trust was pursuing. The review graded sites and classed as Grade 1 three large coastal areas which included important Trust reserves; the Wash Flats and Marshes, Saltfleetby-Theddlethorpe Dunes and Humber Flats and Marshes, six of the Bardney Forest Limewoods, Risby Warren and the River Eau. In Grade 2 there were a further six Bardney Forest woods, five of the Kesteven woods including the Dole Wood Reserve, five lowland grasslands and heaths including Baston Fen, Bratoft Meadows and Moor Closes, and one peatland, Crowle Moors (part of Thorne Moors), most of which is a Trust reserve (plate 2).

Of crucial importance also in increasing the Trust's ability to acquire reserves was the availability of more grant-aid for purchase. Grants had been made from the 1950s onwards by charitable trusts and by the SPNR, but they were on a relatively small scale and, as land prices increased, they were often inadequate to enable purchases to be completed. From 1970 onwards, however, both the Countryside Commission and (after 1973), the NCC were able to give financial assistance which enabled the Trust to expand its acquisition programme and to be somewhat bolder in site selection, taking more account, for example, of additional criteria like landscape qualities and potential for education and public enjoyment of nature. Larger and more expensive purchases could also be contemplated. Increasing volunteer and staff resources for managing more reserves, a vital factor in planning a reserve establishment policy, was also encouraging and, after 1993, the availability of funds through English Nature's imaginative Reserves Enhancement Scheme, not only provided the means for better management of SSSI reserves, but was also a powerful incentive to take on additional commitments. Availability of new funding from external sources, principally from the Heritage Lottery Fund and from Landfill Tax is once again influencing the pace, if not the policy, of nature reserve acquisition. Through such funding, the Trust has already been able to expand existing reserves at the Humber Bank Claypits, Gibraltar Point, the Red Hill and Scotton Common.

From time to time the Trust has revised and updated its reserves establishment policy and the list of potential sites for which it has set priorities according to current needs and circumstances. However, such policies always have to take account of opportunity and threat. The top priority site for any particular habitat may not always become available and it is sometimes the second or third best which is on offer and that requires a difficult decision. The development of a sudden and perhaps unexpected threat to a site may also necessitate an adjustment of priorities for acquisition funding.

Progress in reserve acquisition 1970 – 1998 (fig 4)

By the time of its 21st Anniversary in 1969, the Trust had acquired thirty reserves covering some 2500 acres. All the factors which I have described enabled the pace of acquisition to be quickened thereafter. New acquisition programmes, however, continued to be based primarily on representative habitat criteria, a policy reinforced in new statements in 1989 and most recently in 1996. Coastal holdings were substantially enlarged by the purchase, in 1976, of 172 hectares of Wash saltmarsh at Frampton, where the RSPB later established an adjoining reserve of 376 hectares. On the north-east coast, a licence from the MoD to manage sand-dunes at Donna Nook was converted into a long lease in 1998. The whole reserve there now covers more than 1100 hectares. Further north, the RSPB reserve at Tetney gives further protection to this important stretch of coastline and they and the Trust now co-operate in a joint wardening scheme for the north-east coast.

Representation of heathland and bog was expanded by the purchase, in the 1980s and 90s, of substantial areas of Crowle Moor where the Trust had had a management agreement from 1971 onwards, before the national importance of the Humberhead peatlands was fully recognised. The best remaining areas of wet and dry heath on the Fen edge sands and gravel around Woodhall Spa at Kirkby Moor and Moor Farm were purchased in 1969 and 1970.

The Trust also purchased and leased areas of old pasture in the 'dales' country of the south Wolds on Spilsby Sandstone and Kimmeridge Clay soils: Snipe Dales in 1970 and Sow Dale in the 1980s. Both are attractive landscapes of a type which has largely disappeared. The conifer plantation lower in the Snipe Dales valley was purchased by the County Council in 1987 as a Country Park which is managed by the Trust. It now attracts many thousands of visitors.

The fragments of calcareous grassland in Lincolnshire which survived the first and second agricultural revolutions (40% has been lost since 1940) - maintain a rich variety of characteristic plants and animals some of them rare and endangered. The Great Casterton roadside banks, for example, is a tiny site, that has the best populations of perennial flax and sulphur clover in the county. Robert's Field, now being put back to grassland, may recover some of its lost butterfly and other insect interest. In the north, Clapgate Pits, another classic small site on the limestone, was acquired in 1996 and has now been cleared of the scrub which was smothering its notable flora. Disused chalk pits at Candlesby, Claxby and Little Cawthorpe sustain a flora once much more widespread.

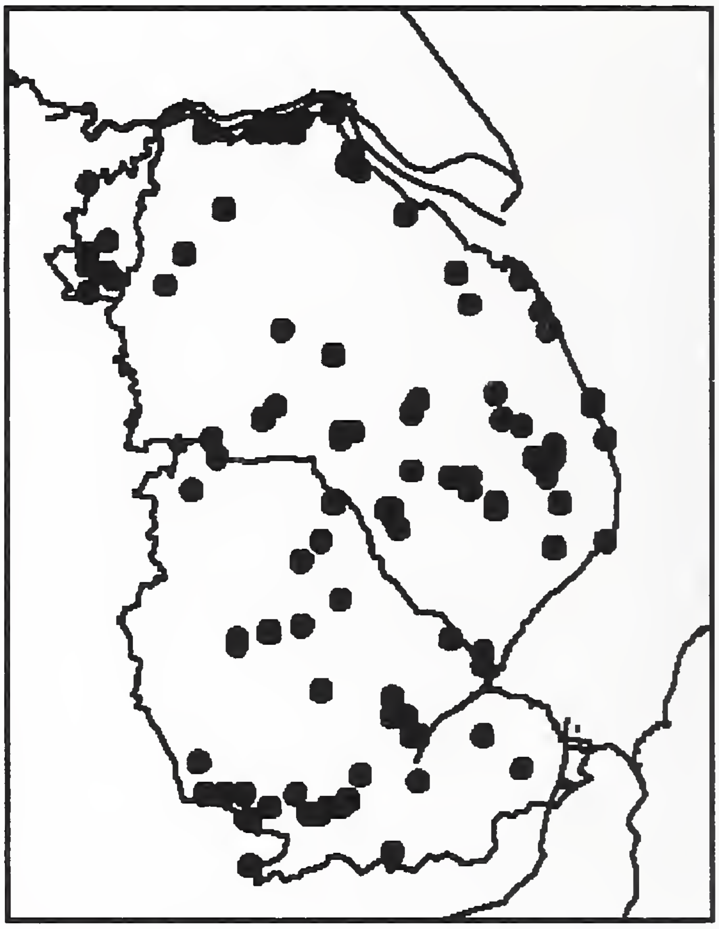


Fig 4. Lincs Trust Reserves in 1998

Woodlands presented a more difficult problem. A large proportion of the best woods were already in the hands of the Forestry Commission when the Trust was started in 1948 and the cost of acquiring any which were available was usually prohibitive in the early days. Of the Trust's first woodland reserves, Friskney Decoy wood was a gift and Claxby Hoplands, on the Middle Marsh boulder clays, was acquired in 1964 from a benefactor at a special price - £2000 for 37 acres. For later acquisitions, Tortoiseshell, Muckton, Rigsby and Lawn Woods, and Goslings Corner benefactions, special appeals and grant-aid were necessary. One special type of wet woodland, the South Wolds alder carrs, is well represented by Keal Carr, Lilley's Carr and Upper Sow Dale.

The Humber Bank Claypits, a legacy of the brick and tile and cement industries, are by far the most extensive reedbed and open water sites in Lincolnshire. Twenty years after the failure to purchase the Westfield Lakes in the early 1950s, new opportunities arose in the 1970s, since when the Trust has acquired most of the pits and reedbeds to the west of Barton and four others to the east. At Far Ings (plate 1), the derelict farm house and buildings have been converted into a popular visitor centre and base for the North Lincolnshire Regional Warden and staff.

Earlier centuries left many such clay pits around the county and there are other smaller ones among the Trust's reserves. In this century, it is disused sand and gravel pits which are producing valuable wildlife habitat. They are, of course, much in demand for water sports and refuse disposal and those which are not so used are often subject to rapid vegetation change, especially around shallow margins. The Woodhall-Tattershall pits selected in the 1950 survey, for example, are now quite unrecognisable from what they were at that time when Dick Cornwallis and I, in the course of the survey, discovered the first little ringed plover nest to be recorded in Lincolnshire. Other examples have become Trust reserves like the splendid complexes at Messingham and Whisby, and the smaller but strategically important sites at Boultham Mere, an old railway ballast pit, and Burton Pits both near Lincoln; at Kirkby Gravel Pit in the Bain Valley and very recently a generous gift of Stanton's Pit at Witham-on-the-Hill. Fen drains are another rich aquatic habitat represented in Trust reserves by the 3½ miles of Metheringham Delph, a disused drainage channel. The extensive sand excavation which has taken place in and around Birds Wood in the Isle of Axholme will eventually provide a large wetland nature reserve in that area.

Far Ings Visitor Centre

photo Lincs Trust

In the Fens, several riverside borrow pits, reedbeds and marsh (known as slipes) have been purchased or leased by the Trust. They form valuable linear refuges for wetland plants and animals once widespread in the old Fenland. At the eight hectare reserve at

Thurlby Fen Slipe, for example, 210 species of flowering plants, 109 birds and 15 dragonflies have been recorded.

I have already referred to the importance of the 55 protected road verges which are, in effect, managed by the Trust as nature reserves. Disused railway lines at Horbling, Belton and Haxey, Willoughby and Woolsthorpe and on the Witham Way are also good examples of linear habitat of particular value in intensively cultivated countryside. Unfortunately the enlightened policy of acquiring disused railway lines as footpaths and nature reserves adopted by Lindsey County Council was discontinued after local government reorganisation in 1973.

Nature Reserves in Lincolnshire – statistical summary

Having reviewed the selection criteria and the acquisition progress of Lincolnshire nature reserves I now offer a few summary statistics.

The Lincolnshire Trust in total currently manages 105 reserves covering approximately 3300 ha (or 8,500 acres). Sixty of the sites are in freehold ownership or, in a few cases, parts of them, and they comprise more than 1000 ha. The remainder are mainly held on long leases or in the cases of a few mainly small sites managed by agreement. Three reserves owned or managed by the Trust; Red Hill, Snipe Dales and Willoughby Branch Line, are designated Local Nature Reserves by Lincolnshire County Council.

English Nature own the National Nature Reserve at Saltfleetby/Theddlethorpe Dunes although the Trust holds some intermediate and adjoining areas which are proposed for NNR status eventually. The existing NNR occupies 440 ha. A small part of the Wash NNR also falls within Lincolnshire.

The RSPB hold three reserves in Lincolnshire – at Frampton Marsh, Tetney and Read's Island, covering approximately 2000 ha, the latter managed jointly with the Trust.

Fresh marsh and dune at Saltfleetby-Theddlethorpe National Nature Reserve owned by English Nature

photo Adrian Fowles

The Forestry Commission own and manage the recently declared Bardney Limewoods National Nature Reserve, which comprises 384 ha in 8 individual woods.

Local Nature Reserves have been designated by **Lincoln City Council** at Swanholme, by **South Holland District Council** at Vernatt's Nature Reserve at Spalding, by **North Lincolnshire Council** at Frodingham Railway Cutting, and by **North Kestevan District Council** at Lollycocks Field at Sleaford.

The Woodland Trust has 18 properties in the county, including the Tattershall Carrs SSSI. The others no doubt have wildlife interest, although the majority have been acquired primarily for amenity reasons.

Scientific and conservation quality of reserves

So much for the statistics. Now what of the scientific and conservation quality of these reserves judged by the national standards set by the Joint Nature Conservation Committee? Of the Trust holdings two are NNRs or parts thereof, Gibraltar Point and Crowle Moors. 50 others are, in whole or in part, designated SSSI. They represent 48% of the total number of Trust reserves, but about 80% of their area. In its own grading system, the Trust has identified a number of sites as A*, which it regards as more or less equivalent in quality to SSSIs. 32 of these are reserves. The three RSPB reserves are all SSSIs, as is one of the Woodland Trust reserves, and Swanholme is a Local Nature Reserve. Of European and international designations Gibraltar Point, the Wash and the north-east coast and Humber reserves are Ramsar sites and Special Protection Areas (SPAs); Gibraltar Point, the Wash reserves and Thorne/Crowle Moors are candidates for Special Area of Conservation status (SAC).

The value of reserves

I want now to consider the value of the nature reserves but, before I do so, let me emphasis that they are only one means of achieving nature conservation. Influencing general use of land and resources and fostering a better understanding and appreciation of the natural world and of our own place in it are both vital to the success of conservation, even to the viability of nature reserves in the longer term. Many of the Trust's reserves in Lincolnshire are small isolated and therefore vulnerable to usages of surrounding land, including industrial and recreational development, drainage and lowering of water tables, and use of pesticides. There are, moreover, wide ranging species of mammals, birds and insects, for which reserves have little, or only seasonal or temporary value. Such species depend very much on conditions in the wider countryside and in the environment generally.

Another problem with nature reserves is that they are relatively expensive to purchase and to maintain effectively. To date the Trust has spent more than £1.6 million on acquiring freehold property. However, you may remember it was the cost of maintenance which deterred the SPNR and the RSPB from acquiring more reserves in the 1930s. On average 60% of the Trust's annual expenditure is devoted to nature reserve management. Availability of grant-aid in recent years has enabled all the voluntary bodies to upgrade standards of management, including employment of more staff. Even so, for a county organisation like the Trust, massive volunteer input, amounting to well over 10,000 man hours per year, is still vital.

If it ever becomes possible to recreate landscape features in intensively cultivated countryside, some of our reserves could act as linkage points in a corridor system which would facilitate the freer movement of plants and animals. Instead of being, in many cases, isolated bastions of biodiversity, they would then become an integral feature of the landscape. The achievement of that will depend, to a large extent, on reform of the

Common Agricultural Policy and it is a grave disappointment and a serious setback to our hopes and expectations that a recent new deal on CAP pays so little regard to the environment.

Habitat Representation

In spite of their limitations, I have no doubt of the necessity and value of nature reserves. Indeed, as land use has intensified, I believe that value has become even greater. Let us look at the sanctuary or, as I prefer to regard it, the 'reservoir' function of reserves. First, what contribution are they making to the protection and management of what remains of Lincolnshire's principal habitats? (table 2).

Table 2. Representation of ecosystems in a selection of Lincolnshire nature reserves (after Blackwood, 1972)

Ecosystem	Nature reserve
Axholme Peatlands	Crowle Moor; Epworth and Haxey Turbaries
North-West Coversands	Scotton Common; Linwood Warren
Fen Edge Sands and Gravels	Kirkby Moor; Moor Farm
Neutral Grasslands in Lindsey Middlemarsh, Clay Wolds and Vale and Kesteven Clay Plateau	Heath's Meadows, Bratoft; Willoughby Meadow; Sotby Meadows; Kingerby Beck Meadows; Hatton Meadows; Bottleneck & Jackson's Meadows; Porter's Lodge Meadows; Moor Closes
Neutral Grasslands in Lindsey Outmarsh	Dawson City
Neutral Grasslands in Wold Lower Cretaceous Strata and Kimmeridge Clays	Snipe Dales; Sow Dales; Silverines Meadow
Lindsey Chalk Wolds	Red Hill, Goulceby; Mill Hill Quarry Claxby
Lindsey and Kesteven Limestone	Dukes Covert; Ancaster Valley; Robert's Field
Fenland	Baston Fen; Thurlby Fen Slipe
Wetlands	Barton Pits; Whisby Nature Park; Burton Gravel Pits; Kirkby Gravel Pit; Messingham Sand Quarry; Sea Bank Clay Pits; Hartsholme
Woodlands in Lindsey Middle Marsh, Clay Vale and Kesteven Clay Plateau	Hoplands Wood; Rigsby Wood; Muckton Wood; Goslings Corner; Tortoiseshell Wood; Dole Wood; Lawn Wood; Skellingthorpe Wood
Woodlands in Lower Cretaceous Strata	Keal Carr; Lilley's Carr; Upper Sow Dale
Coastlands, Sand-dunes and Saltmarsh	Gibraltar Point; Salfleetby/Theddlethorpe; Donna Nook
Coastlands, Saltmarsh	Frampton Marsh; Moulton Marsh; Tetney
Coastlands, Saline Lagoons	Killingholme Haven Pits; Read's Island; Humberston Fitties

Heathland – of the approximately 630 hectares of wet and dry heath, 32% (168ha) is in six nature reserves.

Peatland/raised bog – of the 247 ha, 87% (216ha) is in three reserves.

Hay meadows – of the estimated 142 ha, 40% (57ha) is in the thirteen nature reserves.

Sand-dunes – of 380 hectares of sand-dunes and related freshwater slack and saltmarsh, some 95% (360ha) is in three reserves.

Reedbeds – it is impossible at present to give a total figure of this habitat for the county, but the largest reedbeds and a very high proportion of the county total is included in five Trust reserves.

Saline lagoons – of approximately 70 hectares, 90% (65ha) is in nature reserves.

Statistics for woodland (except for the 384 ha of Lincolnshire limewoods in the Bardney Forest NNR), for wetlands and for saltmarshes are difficult to assess.

Representation of Species

What contribution do nature reserves make to the welfare of endangered species in Lincolnshire? I use the figures from the Trust's publications (Smith, 1988, 1996), audits of habitats and endangered species with recommendations for action. Of the 113 plants listed, 59 are in nature reserves or on protected road verges, 24 are confined to them, 20 of those in only a single site and 17 more occur in only one other site. Of the nine national Red Data Book species, four occur on nature reserves, two of them on only a single site.

Table 3. Representation of Species on Lincolnshire Reserves

	No. in *Nature in Lincolnshire*	N° in reserves	N° confined to reserves	N° confined to reserve and one other site
Plants	113	59	24	17.
Birds	20	20	2 (breeding)	-
Amphibians	4	4	1	1
Molluscs	11	7	4	1
Butterflies	7	5	2	-
Macro-moths	52	41	27	7
Beetles	20	10	10	4
Flies	14	6	6	-
Grasshoppers & crickets	2	2	2	-

Among the animals, nesting sites for bearded tit (plate 7) and little tern, both national RDB species, are almost confined to nature reserves. Heathland reserves provide some of the best nightjar and woodlark nesting habitat in the county. Some reserves, especially on the coast, provide vital winter and migration season feeding and roosting habitat for birds and

Little Tern - confined to Reserves in Lincolnshire

photo Geoff Trinder

breeding habitat for seals (plate 8). The natterjack toad (plate 6) is confined to two nature reserves, having once been widespread in the old Fenland. Three of the eleven scarce non-marine molluscs are recorded only on reserves. Among other invertebrates confined to reserves are bog bush-cricket, and large heath butterfly, whilst four of the six sites for grizzled skipper are in reserves. Of the 52 macro-moths in the list, 35 are on reserves, 23 of them confined to them and, of listed 21 beetles, 11 are confined to reserves. Whilst the *Nature in Lincolnshire* statistics now need updating, particularly the invertebrates, there is little doubt about the importance of reserves in conserving plant and animal populations.

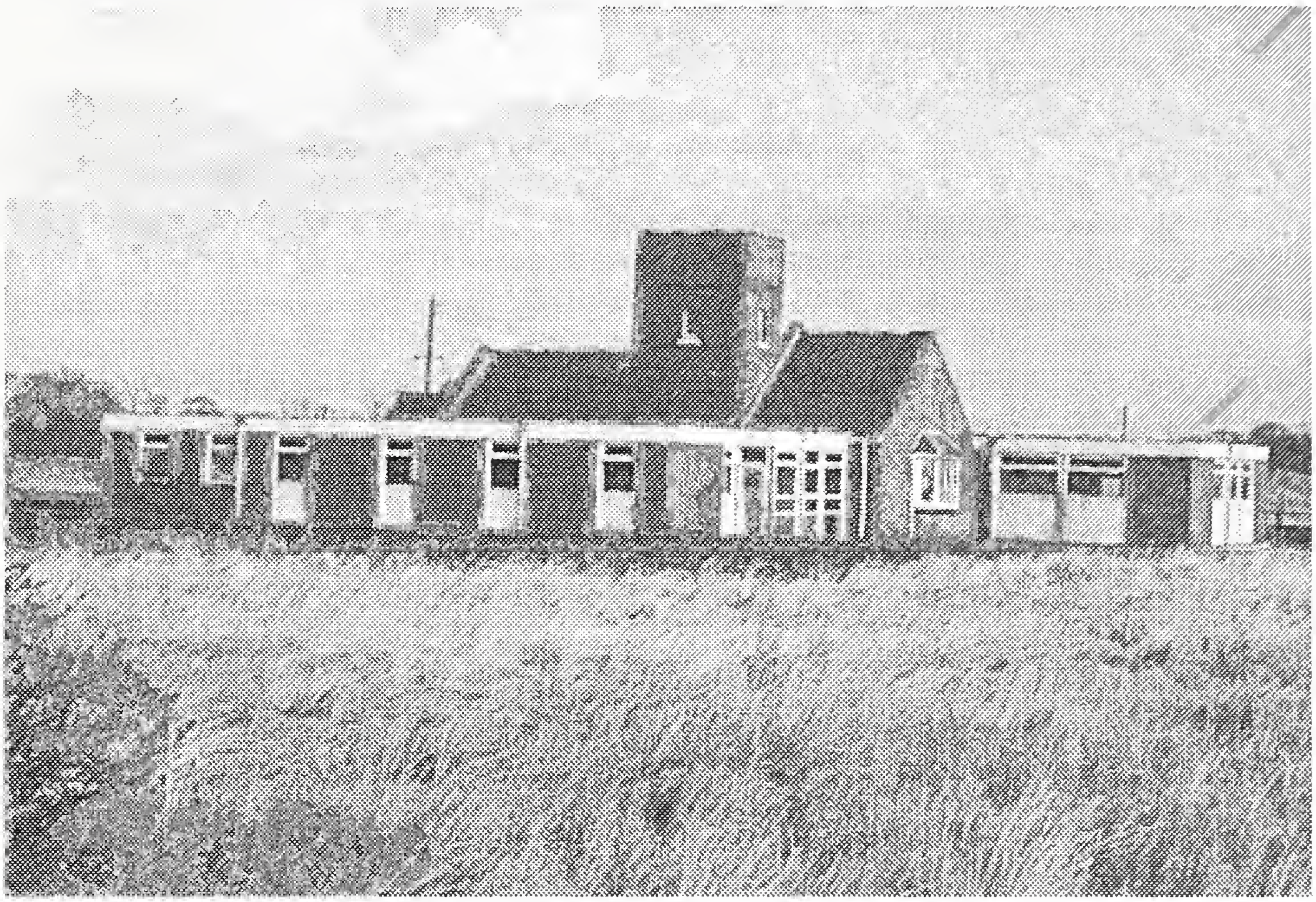
Bog bush cricket *Metrioptera brachyptera* is known in Lincolnshire only from Crowle Waste, Kirkby Moor and Moor Farm reserves. photo Roger Key

Protective Value of Reserves

Another way of recognising the value of our nature reserves is to assess, as far as possible, what would have happened to them had they not been secured and managed as reserves. I estimate, and it is a very conservative estimate, that at least ten of the Trust's reserves would almost certainly have been destroyed or seriously damaged. Another 14 are likely to have been destroyed or damaged by other uses, considering what has happened to adjoining land or sites of a similar nature. In another seven, neglect, already far advanced when the sites were acquired, would have led to irreversible deterioration of habitat. In making these estimates I have taken into account the possibility that planning restrictions and/or the SSSI provision would have prevented or mitigated destruction. SSSIs, initially, however, proved completely powerless for that purpose in the case of agricultural and forestry operations and, without the influence of conservation bodies like the Trust and the prior establishment of a nature reserve, planners would have been much less likely to halt damaging development. In some cases like Messingham Heath they failed to do so.

Educational and Research Value of Reserves

I have already referred to the educational and research functions of reserves and their amenity attractions. In those respects, I need only point to the success of the work at Gibraltar Point, which has the only residential field station on a National Nature Reserve in the country, at Far Ings, Whisby, Snipe Dales, Hartsholme and elsewhere. That some 500,000 people visit Lincolnshire nature reserves each year speaks for itself. Fostering people's appreciation and understanding of nature by bringing them into direct contact with it is, I believe, the surest way of enlisting their concern and support for conservation.



Gibraltar Point Field Centre - the only NNR field centre. photo RB Wilkinson

I referred earlier to the vital importance of adequate information for the selection of potential reserves as well as for their management. The development of computerised information systems, in particular the "Recorder" biological recording package, and the collaboration between the Lincolnshire Trust and the Lincolnshire Naturalists' Union and other bodies in using them is proving of tremendous value for both purposes. For those of us who remember the 'back of envelope' recording days, the transformation is magical. In its turn, the ability to store and retrieve information so readily has acted as a stimulus to recording and monitoring. That has also been true, I believe, of the establishment and management of nature reserves. They have acted as focal points for detailed exploration of flora and fauna which has contributed substantially to our knowledge of Lincolnshire's natural history. This happened right at the beginning, with the creation of the Gibraltar Point reserve, and is evident from the contributions to the early field station reports which were published from 1949 to 1954. The setting up of the bird observatory there in 1949 also undoubtedly helped to stimulate ornithology in the county after a period of relative inactivity. Perhaps it is also significant that nature reserves have been the subject of at least six presidential addresses to the LNU in recent years.

Values for earth science local history and archaeology

Reserves have yet other values. Their geological and geomorphological interest would provide material enough for a separate address. Their historic and archaeological interest is manifold. Many of them represent landscapes and land usages, such as traditional hay meadow and coppiced woodland, which have otherwise largely disappeared. Take, for example, the little chalk pit at Claxby-by-Alford. It shows a fine exposure of the middle and lower chalk; it has a bronze-age burial mound on which once stood a post mill catching all the wind from the Marshland which it overlooks; two mid 19th century lime kilns; the remains of a blacksmith's forge, all that in addition to being a place of great natural interest and beauty. Not far away, Rigsby Wood (plate 4) is mentioned in 13th century charters and its great northern boundary bank, covered with bluebells, is evidence of the economic value of woodland in the Middle Ages.

Nature reserve policies for the future

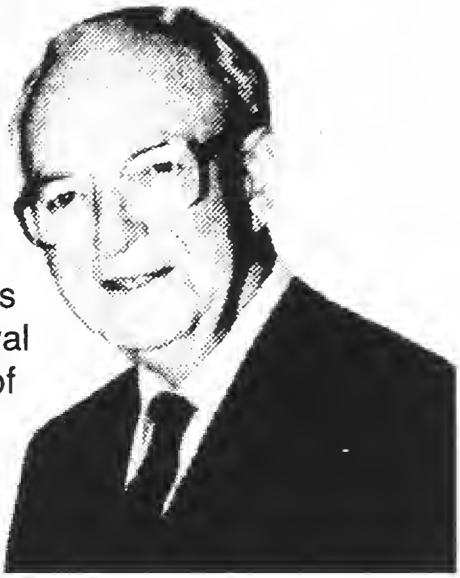
So what of the future? Do we need more reserves? In my view, emphatically yes! It is true that bodies like the Forestry Commission and the Environment Agency are now specifically charged with promoting conservation and they are actively doing it, for example, by recreating heathland from conifer plantations and by restoring riparian features and washlands. That is certainly a tremendous advance on the situation as it was thirty or forty years ago. SSSI protection is also much more effective than it used to be and the Government is promising yet more effective measures. English Nature are encouraging appropriate management by private SSSI owners through positive management agreements and their grant-aiding Wildlife Enhancement Scheme which has been used at a number of sites in Lincolnshire. Nevertheless, pressures on wildlife and the countryside are unrelenting and the CAP reform package will do little to alleviate them. Ownership and management by voluntary conservation bodies remains not only necessary, but provides the best long-term security for nature reserves.

More specifically, there are habitats in the county which are still under-represented in reserves – heathland, for example, more particularly wet heathland, one of the rarest and most threatened habitats; there are no reserves on the northern chalk and few Kesteven woodlands. One of the most rapidly shrinking habitats today is old grazing marsh pasture, once the predominant land use in the Lindsey Outmarsh and now subject of a specific Habitat Management Plan under the UK Biodiversity Action Plan. Unless the decline can be halted by economic incentives, acquisition of some large blocks of pasture as nature reserves may become necessary.

Even more important perhaps is the need to expand existing reserves, many of which are small and vulnerable to potentially damaging activities on adjoining land, for example intensive drainage, the effects of pesticide use or building development. Better viability for these reserves should be a primary aim. In that connection, the expansion to create larger reserves is also highly desirable, in particular the recreation of an extensive area of fenland habitat on which the Trust has already made a preliminary study. With increasing interest in nature and wild places, more resilient sites of general appeal like Whisby Nature Park and Snipe Dales Country Park must also be found or created. "Honey-pot" sites like these also help to take the pressure off more fragile areas. Finally, biodiversity action planning, which is involving a wide range of partner bodies in the voluntary and statutory sectors, is focussing new attention on habitats and species, nationally and locally, and this is bound to influence nature reserve selection which is still a developing process as it has been for all the last fifty years.

A five-year programme of funding by the Heritage Lottery Fund is enabling the Trust to make further improvements to the management of a large number of its reserves and, where appropriate, facilitating study, research and public interest. One such purpose is the restoration and recreation of habitat of chalk grassland at the Red Hill, of heathland at Scotton Common and of wetland at Gibraltar Point. The restoration of the limestone grassland at Robert's Field at Holywell after thirty years under conifers is now almost complete. Given the resources and the technical expertise we can certainly expect to see such restoration assume increasing importance in the Trust's nature reserves policies.

For fifty years the Trust has pursued an ambitious programme of nature reserve establishment. I hope and believe that it will continue. The present availability of funding for acquisition and management is an opportunity which has to be grasped, but in the long run it is likely to be the degree of local voluntary support and participation which will determine how much can be achieved and sustained.



Lincolnshire born Dr AE (Ted) Smith PhD, OBE, CBE, joined the Lincolnshire Naturalists' Union in 1939 and became the 105th president of the in 1998/99, having formerly been the 56th president in 1968/69. He was one of the people instrumental in setting up the Lincolnshire Trust in 1948, being the secretary from its inception until 1968, then chairman until March 1999, when he took over as the Trust's president. He was responsible for the gaining of the Royal charter of Royal Society for Nature Conservation in 1981, of which he is currently Vice-president. He was awarded the OBE in 1963 and CBE in 1999 for services to nature conservation. He has been council member of the NCC, National Trust and RSPB.

May I thank you for the honour you have done me by electing me as your President for a second time. Whilst it gives me great personal pleasure I regard it pre-eminently as a tribute to the Trust on the occasion of its Golden Jubilee and as a symbol of the close relationship between the Trust and the Union. I have, incidentally, just celebrated another anniversary of which I am quite proud: 60 years membership of the LNU. **Ted Smith**

(Up-to-date information on Trust reserves can be found in the Trust's reserves handbook (Crooks, 1997) and on the Trust's website at: *http://www.lincstrust.co.uk/index.html*).

References and further reading

BLACKWOOD J. W. 1972. The distribution of nature reserves in the natural regions of Lincolnshire. *Trans. Lincolnshire Naturalist's Union.* **18**, 1-6.

BLACKWOOD, J.W. 1968. Lincolnshire Grasslands. *Newsletter of the Lincolnshire Trust for Nature Conservation* **33,** 3-8.

CROOKS, S.E. (ed.) 1997. *Your Guide to Nature Reserves in Lincolnshire.* Lincolnshire Trust for Nature Conservation. Horncastle.

ENGLISH NATURE 1995a. *Grassland Inventory. Lincolnshire.* English Nature, Peterborough.

ENGLISH NATURE 1995b. *Grassland Inventory. Humberside.* English Nature, Peterborough.

ENGLISH NATURE/RSPB. 1994. *The Lowland Heathland Inventory: Humberside.* English Nature. Peterborough.

ENGLISH NATURE/RSPB. 1996. *The Lowland Heathland Inventory: Central Counties.* English Nature. Peterborough.

HUGHES, D.P. 1988. *Lincolnshire Inventory of Ancient Woodland.* Nature Conservancy Council. Peterborough.

HUXLEY, J.S. & TANSLEY, A.G. 1947. *Conservation of Nature in England and Wales. Report of the Wild Life Conservation Special Committee (England & Wales).* Ministry of

Town & Country Planning. HMSO. London.

KEY, R.S. 1986. *Invertebrate Site Register. Review of Invertebrates Sites in England. Humberside.* 2 vols. Nature Conservancy Council. Peterborough

KIRBY, P. 1987. *Invertebrate Site Register. Review of Invertebrates Sites in England. Lincolnshire.* 2 vols. Nature Conservancy Council. Peterborough

NATURE RESERVES INVESTIGATION COMMITTEE. 1945. *Nature Conservation in Great Britain.* Conference on Nature Preservation in Post-War Reconstruction Memorandum 3. Society for the Promotion of Nature Reserves. London.

PERRING, F H. & WALTERS, S. M. 1962. *Atlas of the British Flora.* Thomas Nelson & Sons for Botanical Society of British Isles.

RATCLIFFE, D.A. 1977. *A Nature Conservation Review.* 2 Volumes. Cambridge University Press. Cambridge.

ROTHSCHILD, M. & MARREN, P.1997. *Rothschild's Reserves.* Harley Books. Colchester.

SMITH, A.E. 1969. *Nature Conservation in Lincolnshire.* Lincolnshire Naturalist's Union. Lincoln.

SMITH, A.E. 1988. *Endangered Wildlife in Lincolnshire & South Humberside.* Lincolnshire Trust for Nature Conservation. Alford.

SMITH, A.E. (ed.). 1996. *Nature in Lincolnshire- towards a biodiversity strategy.* Lincolnshire Trust for Nature Conservation. Horncastle.

SOCIETY FOR THE PROMOTION OF NATURE RESERVES. 1915. *Provisional schedule of Areas considered worthy of Preservation in the UK.* Hazell, Watson & Viney Ltd. London.

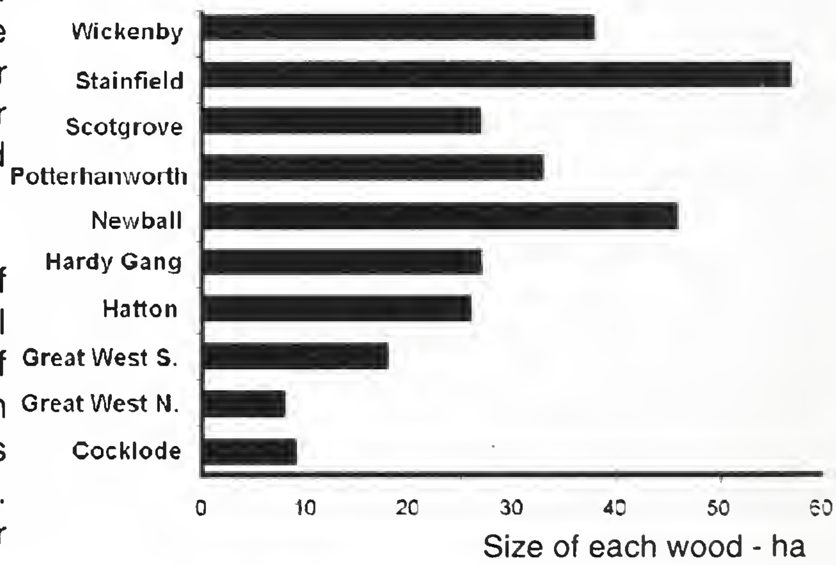
SPENCER, J. 1989. *Humberside Inventory of Ancient Woodland.* Nature Conservancy Council. Peterborough.

TANSLEY, A.G. 1945. *Our Heritage of Wild Nature.* Cambridge University Press. Cambridge.

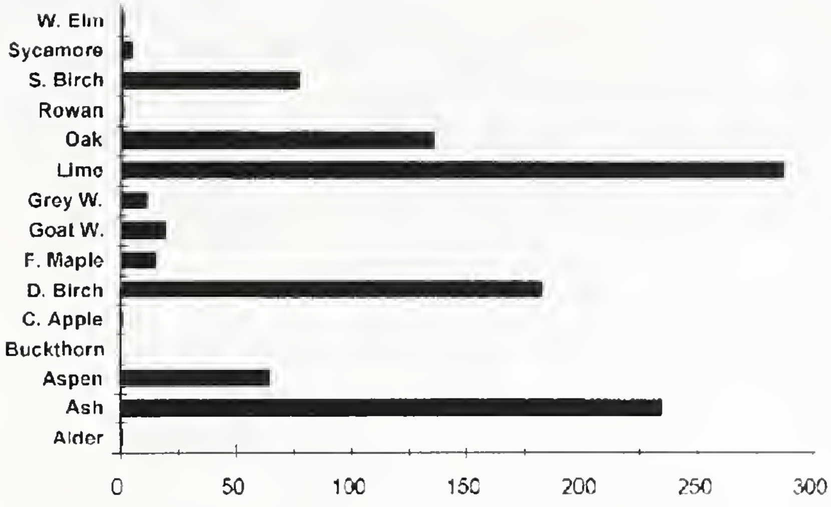
HOW MUCH SMALL-LEAVED LIME OCCURS IN THE 'LIMEWOODS' OF CENTRAL LINCOLNSHIRE?

Sally Oldfield and Graham Weaver

Lincolnshire lost most of its woodland very early in history: the Domesday Book makes this clear (see map reproduced in Gibbons (1975). It shows, however, that three concentrations of woodland survived at that time, one of which was in the Wragby/ Woodhall Spa area which has largely been sustained through to the present day. This central Lincolnshire concentration is situated towards the south of the Lincolnshire Coversands and Clay Vales Natural Area (see Weaver, 1997). Since the 1960s it has been gradually realised that a group of these central Lincolnshire woods (the 'Bardney Limewoods') are of major national importance, in particular for the large quantities of small-leaved lime *(Tilia cordata)* present.



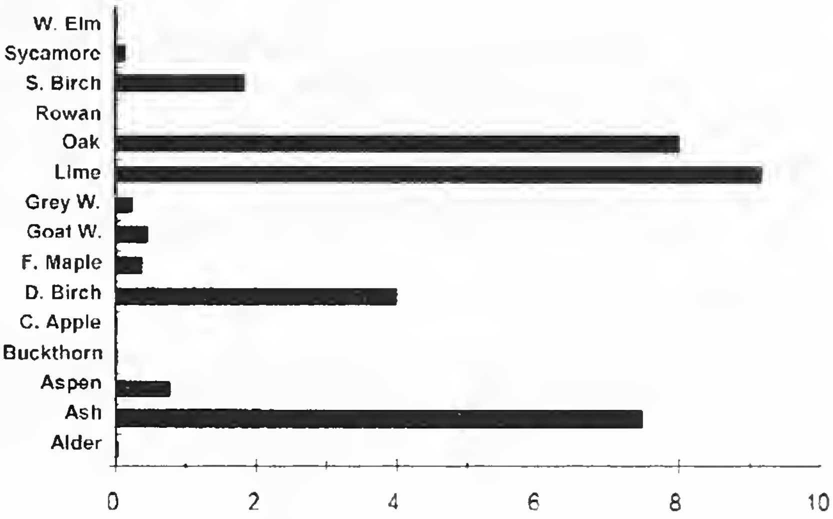
During 1981 and 1982, seven of these woods were surveyed by local Nature Conservancy Council staff (Tim Clifford, Fiona Angier and John Walker) to quantify the tree species composition and tree basal areas. This work will act as a base-line for



Mean number of stems per hectare (all woods)

future comparisons, assessing the impact of different management regimes. The point-centred quarter method of sampling (Cottam and Curtis, 1956) was used. Some of the results are summarized here, together with some comparable results for Great West and Cocklode Woods derived from an MSc study undertaken at the same time (Weston, 1981). A fuller report has also been produced, which includes the NCC's raw data (Oldfield, 1995).

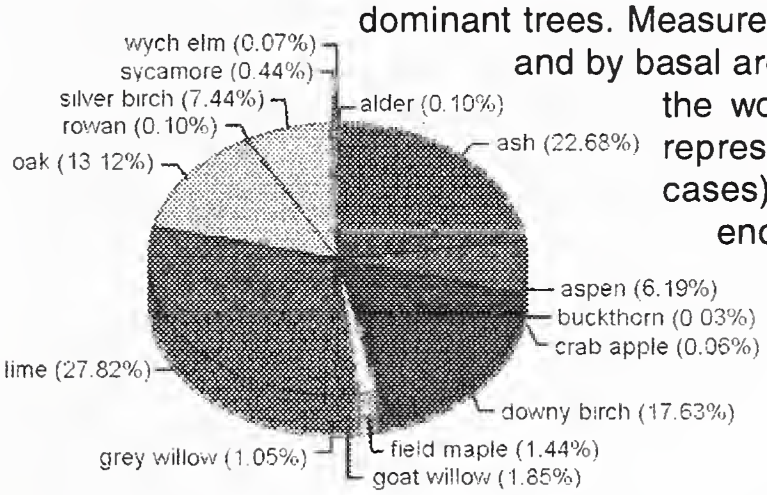
Although predominantly on clay sites, sometimes waterlogged sandy soils are also present, and soil pH ranges from mildly acidic to mildly alkaline. Using the National Vegetation Classification, a number of W8 (*Fraxinus excelsior - Acer campestre - Mercurialis perennis*) and W0 (*Quercus robur - Pteridium aquilinum -Rubus fruticosus*) sub-communities can be identified.



Mean basal area per hectare (all woods)

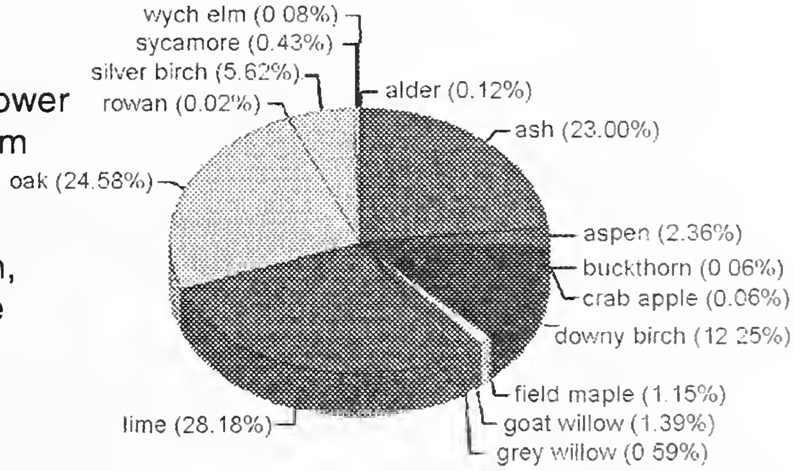
Results

The surveys demonstrated the major significance of small-leaved lime in these woods. Lime, pedunculate oak *(Quercus robur),* ash *(Fraxinus excelsior),* and the birches *(Betula pendula and B. pubescens)* were the dominant trees. Measured by both number of stems per hectare and by basal area per hectare, grouping the data for all the woods, lime had the highest percentage representation of any tree (about 28% in both cases). In all, 14 species of tree were encountered. Only one shrub, common buckthorn *(Rhamnus catharticus),* was recorded as there is a lower limit to stem diameter for recording purposes. In fact, many other shrubs can be found (see Peterken, 1998), reflecting the long history of these woods and their varying soils.

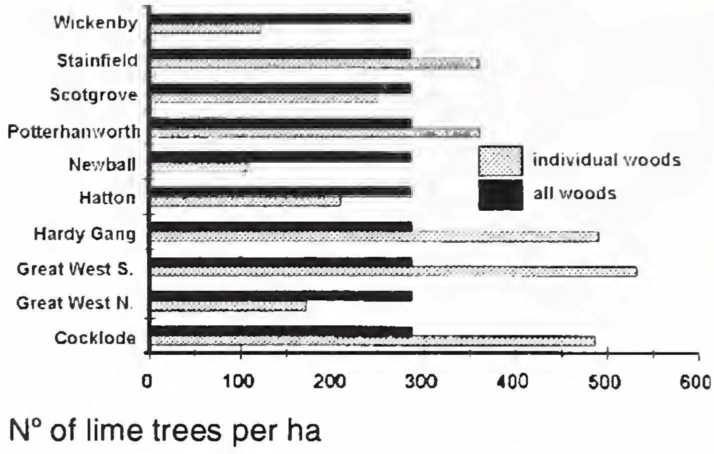


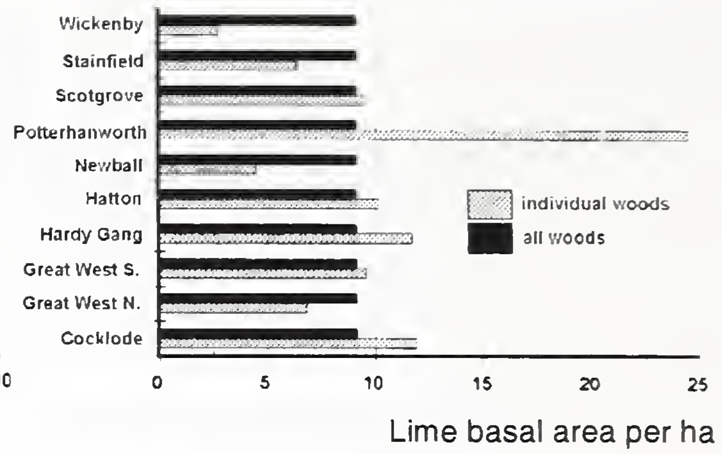
% tree composition per hectare all woods

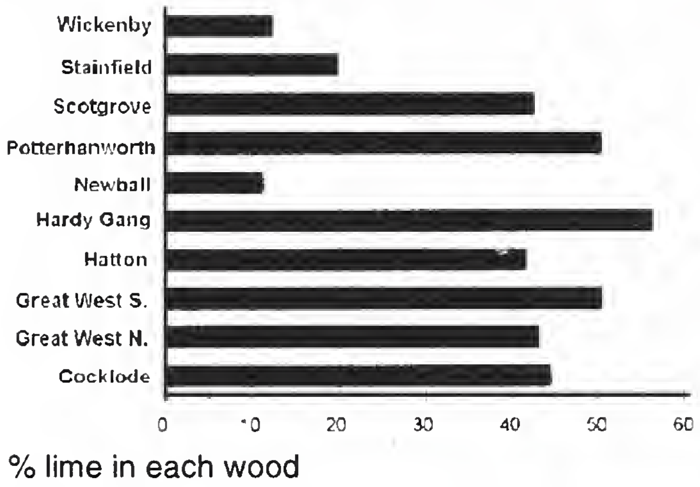
Comparing the results for individual woods highlights variations due to

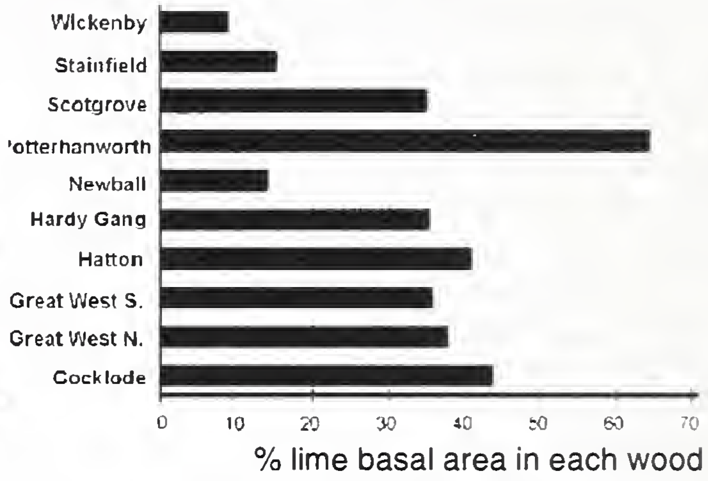


% basal area per hectare - all woods

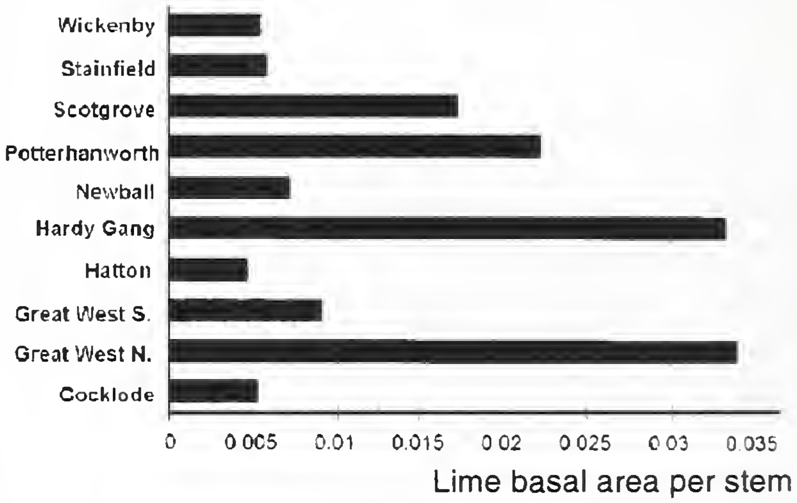








differing soil types and management history. For example, the abundance of lime ranges from 11% of the total trees in Newball Wood to 56% in Hatton Wood, and from 109 stems per hectare in Newball Wood to 487 in Cocklode Wood (which has had a different management history from its contiguous Great West Wood), while the average basal area per stem of oak ranges from 0.015 m^2 in Wickenby Wood to 0.135m^2 in Hatton Wood.



More information is summarized in the figures.

Conclusions

The survey and analyses highlight the remarkable amount of small-leaved lime to be found in these woods. In this respect they may be the most extensive examples of their kind in Britain. Unique as a group, the individual woods are distinctive in species composition and tree size structure, with wide variation between woods not only in the abundance of lime, but also in the relative dominance of ash and oak and in the occurrence of other species. The sizes of trees are also shown to differ from wood to wood. Further analysis of Great West Wood reveals that there can also be appreciable variations within an individual wood.

These conclusions on the overall richness and variation between woods are being amply reinforced by the recording work of many LNU members in the limewoods, particularly with regard to invertebrates.

Sally Oldfield was working as a volunteer for English Nature when she produced her analysis of the 1981/82 survey data. Graham Weaver is Parish Environmental Surveys project coordinator, based with Lincolnshire's Community Council. GW would like to acknowledge the very friendly and co-operative working relationship maintained by Forestry Commission while working for English Nature, providing advice on the management of the limewoods between 1985 and 1994.

References

COTTAM, G. & CURTIS, J.T., 1956. The use of distance measures in phyto-sociological sampling. *Ecology* **37,** 451-460.
ENGLISH NATURE, 1997. Natural Area Profile: Lincolnshire coversands and Clay Vales. English Nature, Grantham.
GIBBONS, E.J., 1975. *The Flora of Lincolnshire.* Lincolnshire Naturalists' Union, Lincoln.
OLDFIELD, S. 1995. *Tree species composition and size distribution in some small-leaved lime woods of central Lincolnshire.* Unpublished report to English Nature.
PETERKEN, G.F. 1998. Woodland origin as a factor in the distribution of native trees and shrubs in central Lincolnshire. *The Lincolnshire Naturalist.* **24**. 162-179.
RODWELL, J.S. ed., 1991. *British Plant Communities: Volume 1 - woodlands and scrub.* Cambridge University Press. Cambridge.
WEAVER, G. 1997. Natural Areas and Lincolnshire. *The Lincolnshire Naturalist.* **24**. 95-110
WESTON, P., 1981. *Management of the Lincolnshire Limewoods: a pilot study,* unpublished MSc thesis, Bangor University.

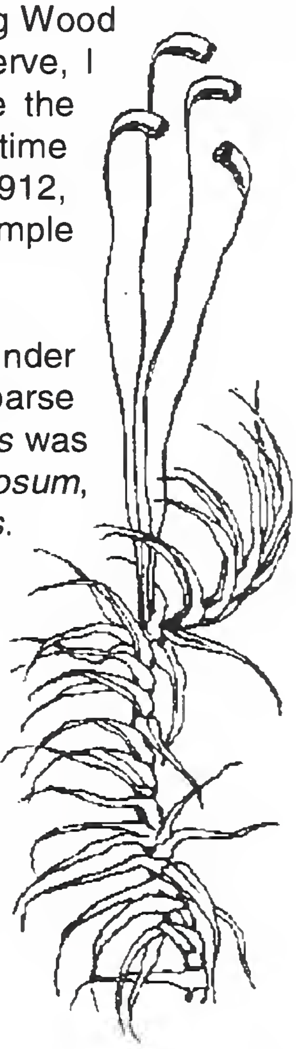
The moss *Dicranum majus* Sm. refound in Lincolnshire.

Tim Smith

On 11 February 1999, whilst looking at the bryophytes of Hardy Gang Wood (TF095750), part of the Bardney Limewoods National Nature Reserve, I found a patch of the moss *Dicranum majus*. This is the first time the species has been recorded for at least 87 years and possibly the only time this century because there is no specimen to support a record from 1912, whereas a record from 1877-79 has an authenticated herbarium sample (Seaward, *in litt*).

At Hardy Gang Wood, *D.majus* grew on the side of a shallow ditch, under the canopy of small-leaved lime, ash, pedunculate oak and birch. Sparse bramble grew over the moss and wood sedge grew nearby. *D.majus* was intermixed with *Thuidium tamariscinum*, *Polytrichum formosum*, *Eurhynchium praelongum*, *Mnium hornum* and *Plagiochila asplenioides*. There was one large patch approximately 30x15cm and occasional stems were scattered nearby.

D.majus is a large, handsome moss with many long, curved and finely tapering leaves which all tend to point in the same direction. The species is characteristic of acid woodlands, particularly in the north and west of Britain, but it also occurs in woods in parts of south and south-east England. The moss is also found in sheltered open turf, on boulders, on hedge banks and in the mountains (Watson, 1981; Smith, 1980; Hill, Preston & Smith, 1992).



after Watson, 1981

D.majus was first recorded in Lincolnshire at Linwood by F.A. Lees in 1877 (Seaward, 1983). Subsequent records were made from Bourne Wood (1880), Woodhall Spa and Stapleford Wood (both 1899) and from "near Louth" in 1912 (Seaward, *in litt*). The nearest post-1950 sites for *D.majus* to Hardy Gang Wood are, according to the Bryophyte Atlas (Hill *et al*, 1992), mid-Norfolk, the Chilterns, Charnwood Forest, the Derbyshire Dark Peak, the southern Pennines and the North York Moors. These sites are 75-100km distant. This record gives hope that the species may still be present in some or all of its old sites and that it may be elsewhere in the limewoods.

References

HILL, MO, PRESTON, CD & SMITH AJE. 1992. *Atlas of the Bryophytes of Britain & Ireland, Volume 2.* Harley Books, Colchester.
SEAWARD, MRD. 1983. A Bryophyte Check-list for Lincolnshire. *Lincolnshire Natural History Brochure No 4,* University of Bradford, Bradford.
SMITH, AJE. 1980. *The Moss Flora of Britain & Ireland.* Cambridge University Press, Cambridge.
WATSON, EV. 1981. *British Mosses and Liverworts*, Third Edition. Cambridge University Press, Cambridge.

Hybridization between pedunculate and sessile oaks *Quercus robur* & *Q. petraea* in parts of Kirkby Lane Woods, Woodhall Spa.

Michael J. Czajkowski

Introduction

Sessile oak *Q. petraea* and pedunculate oak *Q. robur* are two closely related species which prefer different habits but can co-exist and will hybridise. Generally *Q. petraea* prefers wetter well drained acid soils of western Britain whilst *Q. robur* is more tolerant of waterlogged alkaline soils and lower rainfall. Populations in oak woodland were surveyed to assess the possibility that evidence for *Quercus petraea* might be found in what is now considered to be dominant *Quercus robur* mixed woodland. Past climatic conditions of slightly warmer temperatures and more extensive forest cover, which might have encouraged locally higher rainfall, might suggest that *Q. petraea* might have been more common in the past.

Quercus petraea is not common in this area of Lincolnshire, being normally associated with the wetter western side of Britain (Anon, 1998), but has been recorded in the past within the areas examined. Presently, the local climate is considered too dry to favour *Q. petraea,* with rainfall averaging about 600 mm year, although this may have been different in the past. *Q. robur* predominates, although the acid sandy soils might encourage either. The purpose of the project was to see if any trace of *Q. petraea* remains in the general area, either as a parent population or though visible characters seen in the leaves of hybrids, and whether there is any variation in geographical distribution. Two areas of study were selected, areas A and B (fig 1). Area A was centred on grid ref. TF 216 634 and area B on grid ref. TF 223 620.

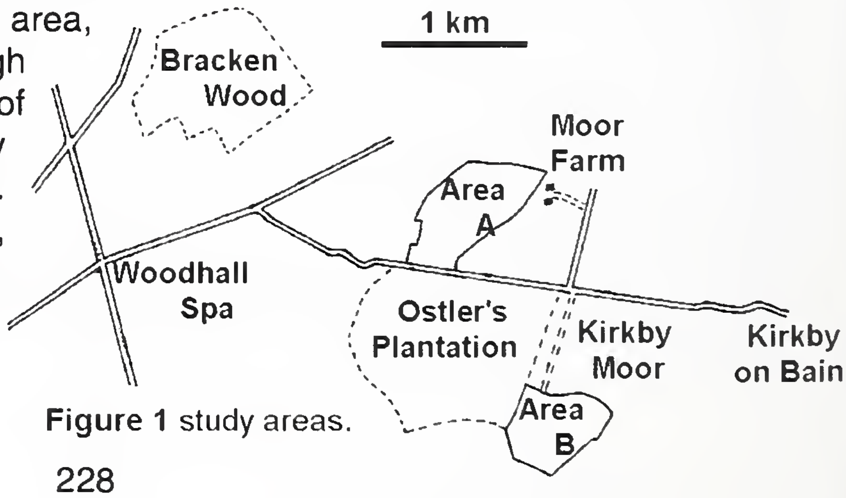


Figure 1 study areas.

AREA A (fig 2)
This area was selected because it has been traditionally recorded as woodland and semi-open scrub which was maintained by grazing in the Middle Ages until the enclosures at the end of the eighteenth century. An ancient, pre-Doomsday woodland, Bracken Wood, was formally adjacent and strongly dominated this area. Its reduced remnant consists largely of oak, ash in parts and with rare elm.

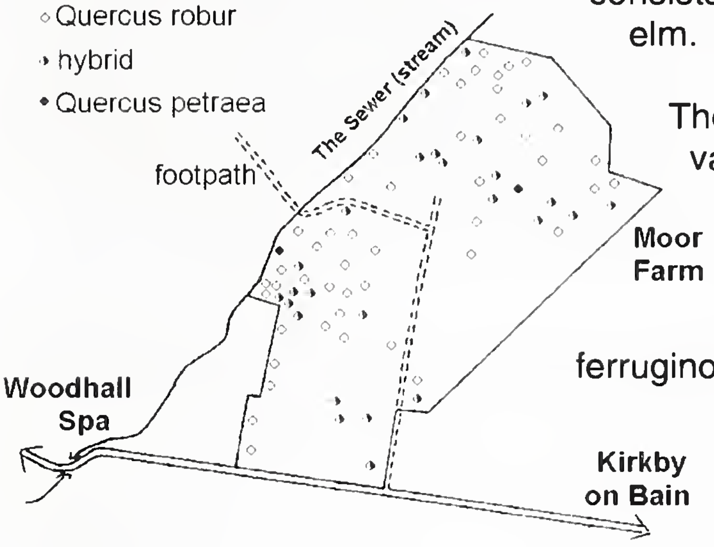


Figure 2 - Area A

The soils reflect the underlying geology of varying thickness of sandy glacial gravel overlying Wragby (Anglian) till, largely composed of Jurassic clays with chalk clasts. This has produced a high water table with iron-rich acid podsols with localised ferruginous "hard pans".

Area A is managed by the Lincolnshire Trust and private owners who have a policy of encouraging the native vegetation. It contains areas where cultivation was attempted in the nineteenth century. These failed owing to the poor soils and were abandoned, after which it regenerated naturally and many large trees were removed early this century. Some disturbance occurred during the war when cultivation was made on small areas as part of the "Dig for Victory" campaign and both these resulted in opening up the woodland for regeneration. The site's position, approximately one kilometre east of the present remnant of Bracken Wood, suggested that pollen brought by the dominantly Westerly winds might still influence the population on this site. Bracken Wood was not accessible for study.

AREA B
Sessile oak *Q. petraea* was specifically listed here by the Lincolnshire Trust in the 1970s, although the its exact location was unrecorded, when they acquired the Kirkby Moor reserve, which includes the area.

Area B was selected because it constitutes the highest part of Kirkby Moor and is situated about 1 km E.S.E. of area A, separated from it by a pine plantation, Ostler's Plantation, which was planted in the late nineteenth and early twentieth century. It is higher than area A and orthographic rainfall is increased, though the site is better drained. Again, pedunculate oak, *Q. robur,* is considered dominant. Pollen could have been blown from site A and, in former times, from the more extensive Bracken Wood, influencing population characteristics and in which case, the results may suggest that they are parts of the same population.

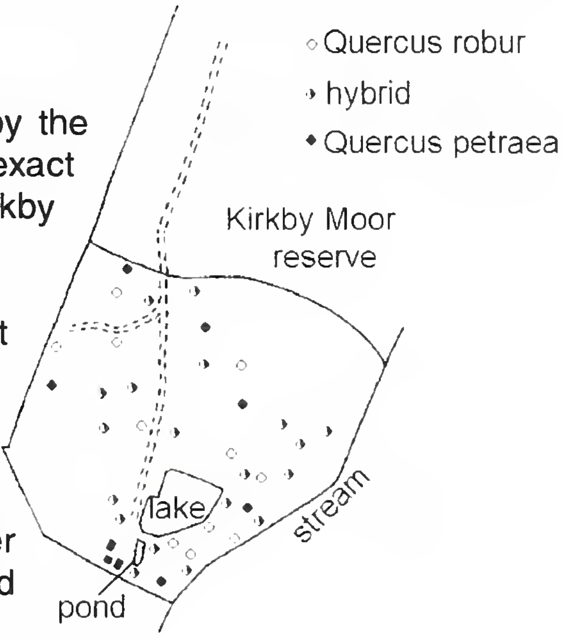


Figure 3 - Area B

The purpose of the study in area B was to see how evidence for *Q. petraea*, if present, differs from area A. The slightly better conditions for *Q. petraea* in area B, could mean that a larger population might be, or have been present, in which case, parent *Q. petraea* might still exist, or that hybrids might show more characters of *Q. petraea* with a lesser degree of introgression with *Q. robur* compared with area A.

Area B has been adjacent to moorland and scrub with isolated woodland since the Middle Ages and was maintained by grazing. At the end of the last century the area was used as catchment for the Woodhall Spa Water Company water supply and additional woodland was encouraged, though the area was mainly left to manage itself. With the removal of livestock from the area near the bore-holes by the water company, that area has regenerated to woodland and was used for the area of study.

The soils of the two areas are similar, suggesting that they should not produce a growth rate significantly different between the two areas. The soils in area B are podsols, acid and sandy. They overly glacial channel sands and sandy glacial gravel of varying thickness overlying Anglian till. The site drainage varies from being well drained, better than site A, to wet areas where the sands thin over positive undulations in the underlying Till surface.

Observational procedures

Leaves were collected in early to mid June 1998 over 10 days to ensure as much similarity of growth as possible. Trees were selected with trunk diameters of between 23 to 46 cm. on both sites to ignore saplings and older parent trees that might reflect planting from the time of the enclosures, or their immediate offspring. It was the practice to plant in the enclosure hedgerows to give a source of timber and thus such parent trees might be imports. The chosen trunk width would probably give a maximum age of about 50 - 60 years allowing several generations to interbreed.

Tree shape was ignored. Many trees in area A have a characteristic shape associated with *Q. petraea*, but would have grown alongside birch and other rapid colonisers which would have forced a tall narrow tree with upward reaching branches, even in *Q. robur;* a trick traditionally used by foresters to produce tall straight timber. Today branch thickening and typical *Q. robur* spreading is developing in the crowns of area A, now much of the birch which was common in that area in the early part of the century, has died out.

Some attempt was made to space out sampling to cover the site equally, but some areas were physically inaccessible while others contained few suitable trees and, consequently, sampling for those areas was poor. Leaves were collected from 81 trees in area A and 38 trees in area B

Trees exhibited large variation in leaf shape and size, mainly according to where on the tree they grew. It was impossible, with the equipment available, to collect leaves all from the same aspect, although attempts were made not to collect large shade leaves or small young leaves. In practice, a stem containing several leaves of each plant was collected and a "typical" leaf measured to reduce unusual variations that the tree might exhibit. The trees in area B generally have a more characteristic *Q. robur* shape than in area A, but this might reflect more open conditions during oak colonisation on this part of the moor.

Character Interpretation and scoring

Characters were scored as follows, based on notes supplied by the Open University for the S365 Evolution course (Anon, 1998) (fig 4). Some distinguishing characters of *Q. petraea* were not seen such as hairs on the underside of the open leaf areas, longer petiole, and characteristic branching in trees situated in open areas. This may mean that hybridisation is stronger than the character scoring allows, or ecophenotypic effects are being expressed which might not be observed in future years with minor climatic changes.
Auricles: strongly developed in *Q.* robur, absent in Q. petraea. Scores: present = 0, not present = 2, poorly developed = 1
Hairs on veins on underside of leaf: present in *Q. petraea*, absent in *Q. robur.* Although some hairs were present on the underside of some veins, no hairs were found on the

underside of the open leaf areas with the result that only the former was scored. Scores: Present = 2, not present = 0

Leaf shape index : calculated F= (W3 - W1)/W2. (see diagram) F is high for *Q. robur* and low for *Q. petraea*. Scores: index of 0.51 to +1.0 = 0; 0.50 to 0.21 = 1; 0.20 to -0.40 = 2 (using the means or 0.2 for *Q. petraea* and 0.5 for *Q. robur* as parameters).

Leaf lobe depth index: calculated (a+b)/(c+d) x 100. *Q. robur* is deep and irregular- mean 55, *Q. petraea* shallow and regular - mean 40. Scores: 51 - 75 = 0; 50 - 41 = 1: 25 - 40 =2.

Index of number of pairs of leaf lobe pairs per leaf: *Q. robur* generally 4 or less, *Q. petraea* generally 6 or more. Scores: 4 or less = 0; 5 = 1; 6 or more = 2.

Petiole length index: calculated (length of petiole) ÷ (Total length of leaf + petiole) x 100. *Q. robur* is normally less than 7, *Q. petraea* is normally greater than 7.5. Scores: less than 7 = 0; 7.0 to 7.5 = 1; 7.5 to 27 = 2.

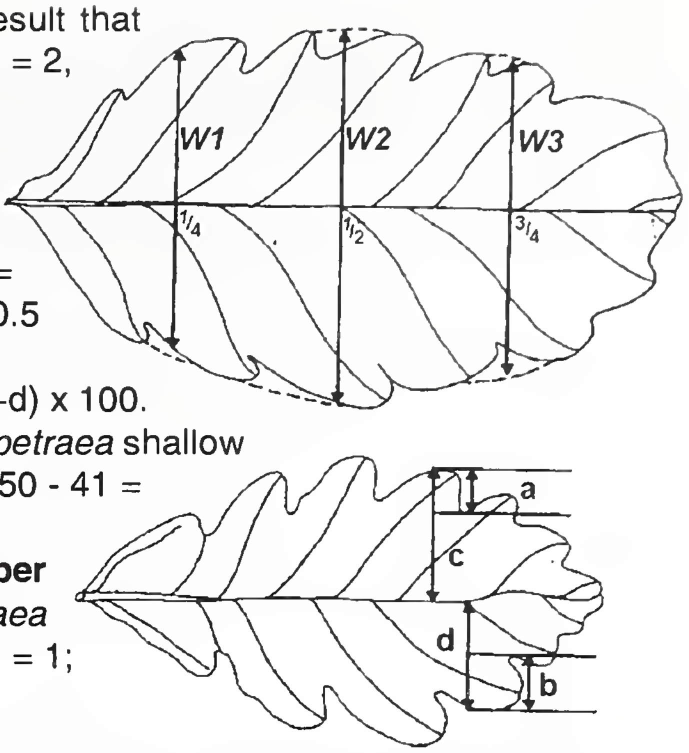


Figure 4 Measurements used in character determination (after Anon, 1998)

Overall, scores break down as follows:

	Q. robur	hybrid	*Q. petraea*
Auricles	0	1	2
Hairs on underside of leaf veins	0		2
Leaf shape index	0	1	2
Leaf lobe depth index	0	1	2
Leaf lobe number index	0	1	2
Petiole length index	0	1	2

Total character score is the sum of scores for each leaf

Results and interpretation

Area A

The scattergram of leaf shape index against petiole percentage length for area A (fig 5) suggests that there is no clustering for characters of long petiole length and low leaf shape index, characteristic of *Q. petraea,* compared to short petiole length and high index, characteristic of *Q. robur,* most of the plots falling in the area suggested for *Q. robur.* This suggests that any hybridisation is

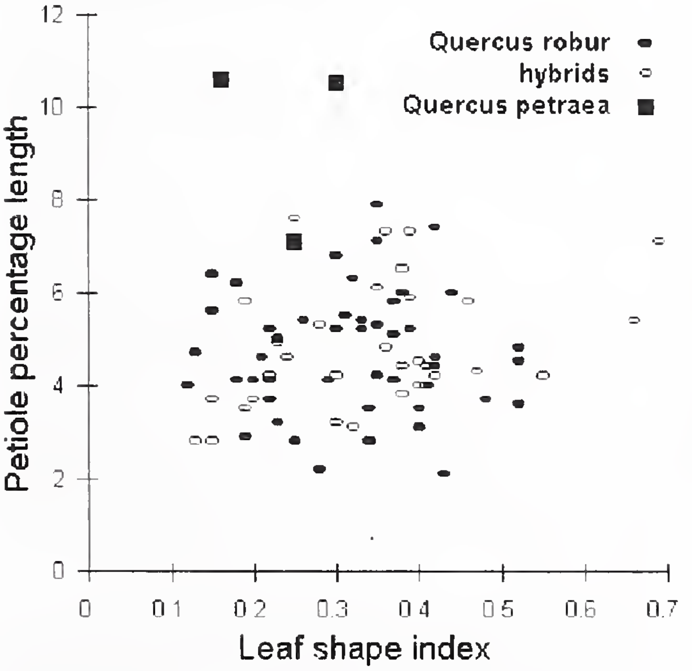


Figure 5 Scattergram of leaf shape index against petiole percentage length - area A

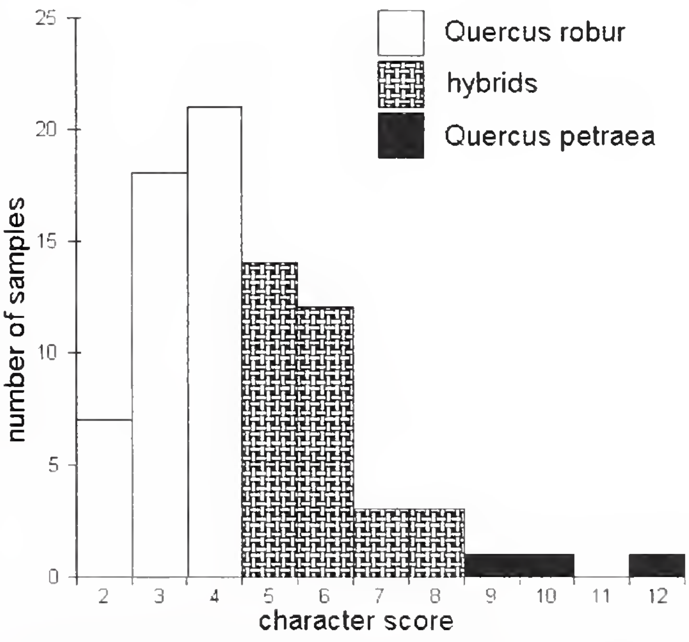


Figure 6 Number of samples for each total character score - area A

dominated by *Q. robur*, as suspected.

The histogram of total character scores (fig 6) showed that *Q. robur* to be dominant species, 57% falling into that category, based on the measured criteria. 4% came under the category of *Q. petraea* and 39% were hybrids. The histogram was heavily skewed towards *Q. robur,* confirming this was the dominant parent. There was a significant number of plots above that expected from just *Q. robur* , suggesting distinct hybridisation between *Q. robur* and characteristics associated with *Q. petraea*. This suggests that there may have been a *strong Q. petraea* influence in the area although the parent *Q. petraea* may now be greatly reduced. Strong clustering on the scattergram around the values dominated by *Q. robur* (above), might suggest introgression between hybrids and *Q. robur* parents.

The actual distribution of trees within area A (fig 2) showed two main clumps of hybrids which might reflect radiations from former isolated parents with strong *Q. petraea* characteristics or true *Q. petraea*.

Area B

The scattergram for area B (fig 7) shows a more even distribution of *Q. petraea/Q. robur* hybrids compared with the scattergram of site A. This suggests that, although hybridisation is still dominated by *Q. robur*, there is a stronger presence of *Q. petraea* than in area A. Also, a higher percentage of leaves with *Q. petraea* characteristics were observed. There was a greater variation than shown in the scattergram for area A, suggesting a stronger *Q. petraea* presence and greater variation of hybrids.

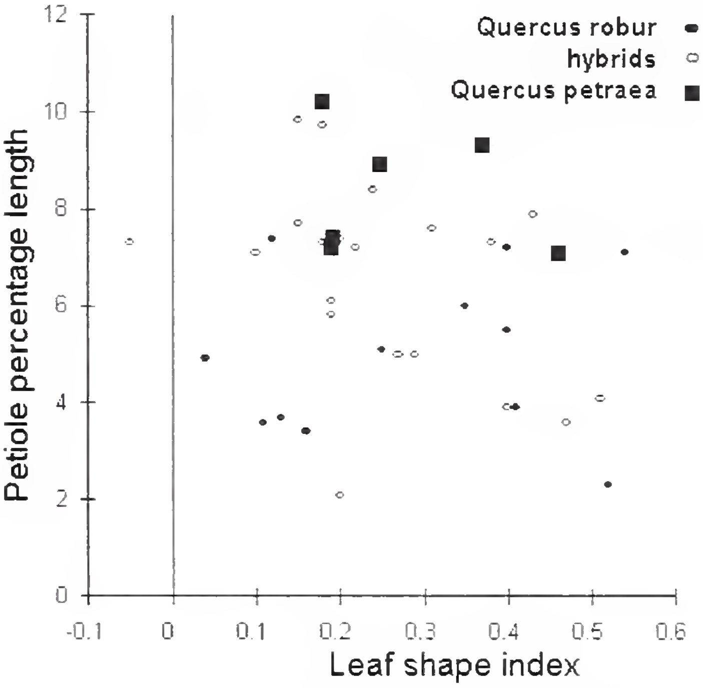


Figure 7 Scattergram of leaf shape index against petiole percentage length - area B

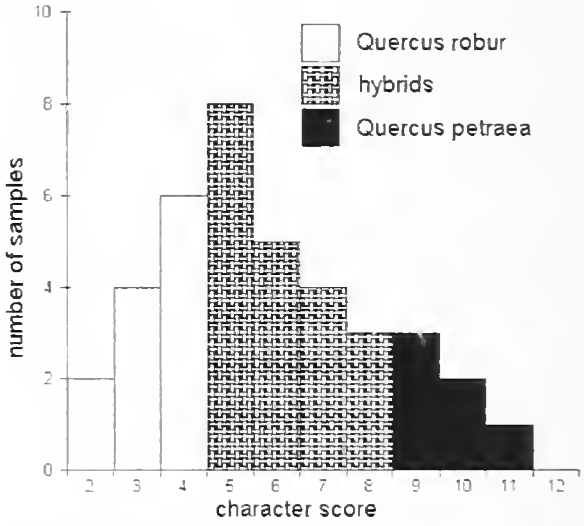


Figure 8 Number of samples for each total character score - area B

The histogram (fig 8) showed that, although *Q. robur* was the dominant species, with 31% falling into that category, it was less dominant than seen in area A. There was also an increase of characters suggesting that *Q. petraea* was present in 16% of the samples. However, the same reservations apply as discussed for area A. The hybrids occupied the main peak of the histogram in area B, comprising 53%. This contrasted strongly with area A where there was a strong skew towards *Q. robur.*

The actual distribution of trees within area A (fig. 3), showed an even hybrid distribution suggesting that the possible hybrids might be in equilibrium with the dominant *Q. robur* population.

It was thought that the slightly different environment might produce a statistically significant difference in the phenotypes seen, but this was not the case with the two variables tested. Statistical analysis comparing leaf shape and petiole length between the two areas (fig 9) using a Z test regression gave Z= 1.42, significance being set at Z = 1.96 (p = 0.05). Thus the differences between the two sets of characters were insufficient to conclude that they were due to anything other than sampling, though there was a large difference between their means. This showed that much of the hybridised variations recorded were due to differences in lobe depth index and lobe pair number.

The histogram for area B, suggests that the sample was not dominated by a particular parent stock. Rather that sample represented a well hybridised stock, possibly in equilibrium. This suggests that there might have been a stronger *Q. petraea* influence in the area compared to area A. The high percentage of scored hybrids compared to area A may also be a result of the better growing conditions for *Q. petraea*, allowing better survival of characteristics locally, once the influences of the ancient woodland (Bracken Wood) had been weakened by intervening agricultural development. This may also suggests that area A may never have had a strong population of *Q. petraea* compared with area B.

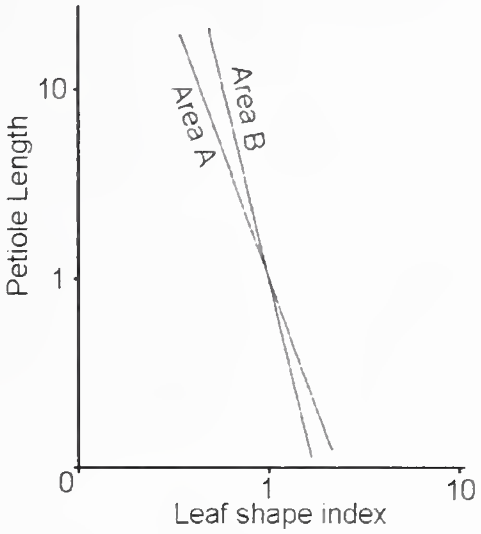


Figure 9 Petiole length against leaf shape index (log scale)

Conclusion

The survey showed hybridisation in both areas between *Q. robur* and *Q. petraea* with area A showing a stronger dominance of *Q.* robur compared with area B, suggesting that *Q. petraea* may have been more abundant in the area, possibly when Bracken Wood, the likely ancestral remnant, was more extensive.

A few true *Q. petraea* may exist in area A. That those indicated are also hybrids cannot be dismissed since features of branching and leaf underside hairs were not clearly displayed. Petiole length in true *Q. petraea* is also often longer then seen in the samples.

The results for area B showed a greater proportion of hybrid phenotypes than in area A consistent with a more normal distribution compared with the strong skew towards *Q. robur* in the histogram for area A. Area B showed a much greater variation of *Q. petraea / Q. robur* hybrids for the characters of petiole length and leaf shape when compared with area A. suggesting a stronger presence of *Q. petraea*, than in area A. Area B seems to represent a well hybridised stock, possibly in equilibrium when compared to the grouped hybrid mosaic of area A which might suggest non-equilibrium diversity.

The better growing conditions for *Q. petraea* in area B may have also allowed better survival of that species, or *Q. petraea* dominated hybrids locally, once the influences of the ancient woodland (Bracken Wood) had been weakened by intervening agricultural development. More extensive forest cover in the past would have increased transpiration with resulting higher rainfall, assisting *Q. petraea* migration at that time. The variations may also be due to the poorer drainage conditions in area A, which may never have developed a strong population of *Q. petraea.* compared with area B.

Alternatively, because there are differences between the micro-climate and drainage between the two sites, the variations might be ecophenotypic, rather than true hybridization, especially in view of the contrasting distribution of scores between the *Q.*

robur populations of area A and area B. Annual climatic variations may also influence leaf shape. This may be indicated by the Z test results suggesting that the areas may effectively be one population originating in the originally larger Bracken Wood. Whether the continued separation of the populations will produce an evolutionary significant divergence can only be resolved with future surveys.

A survey over a wider area of several formerly connected woodlands with different soils and micro-climates might produce different hybrid distribution, while survey of the woods immediately to the west might confirm whether the hybrid mosaic in area A is a result true dispersal, or niche contraction. On-going introgression in both areas might be confirmed with a survey of older trees. If this is the case, then increased isolation and decimation of the ancient parent stock at Bracken Wood, or a change in micro-climatic may be the cause for increased *Q. robur* characteristics.

Clearly these results and interpretations showed that this is a topic that still requires further study to answer all the questions raised by this survey regarding *Q. petraea, Q. robur* and their hybrid distribution, especially on the effects of reduction of the more extensive original woodland cover, whose remnants may exist in Bracken Wood, a woodland listed in the Doomsday Book.

Acknowledgements
I am greatly indebted to Dr. Christina Fearon for her advice in finalising this article. I wish to extend my thanks to Mr. P. Kalinowski and The Lincolnshire Trust for Nature Conservation for their kind permission in allowing me access to the above sites.

Michael J. Czajkowski of Woodhall Spa is finishing an honours Earth Sciences degree with the Open University and this study was carried out as part of the course evolution module.

References

ANON, 1998. *S.365 Evolution. Project Notes, SUP 39193 2,* The Open University. Milton Keynes.

LEATHERBACK TURTLE AT SPALDING

E.J. Redshaw

On 10th September 1997, a leatherback turtle *Dermochelys coriacea* was seen stranded alive on a sandbank in the River Welland at Surfleet Seas End near Spalding by Ian Nicol of Spalding (Anon, 1997). The turtle was found dead on 16th September, 100m down stream of the Fulney Sluice (TF259241). The turtle had become stuck in 90cm of mud, and had been bombarded with bricks by local children (Foster, 1998). It had initially been mistaken for a red eared terrapin, a much smaller species (Foster, *op cit*).

The turtle corpse (probably a female on the basis of its tail length) was visited by members of the Environment Agency, RSPCA and Tom Tew, Ian Reach, Alison Littlewood and Steve Gibson of the Joint Nature Conservation Committee at Peterborough (plate 9) and the following measurements made. It was 2.05 metres long nose to tail and 2.55m across the flipper tips, the fore flippers being 90cm long, and the carapace was 1.72m by 87cm. It weighed approximately 500 kg and its age was estimated to be between 30 -100 years. Various organs and tissue samples were collected for analysis of the turtle's age, DNA analysis to determine its origin and to investigate of levels of heavy metal and organochlorine pesticide levels by universities in the UK and in the United States.

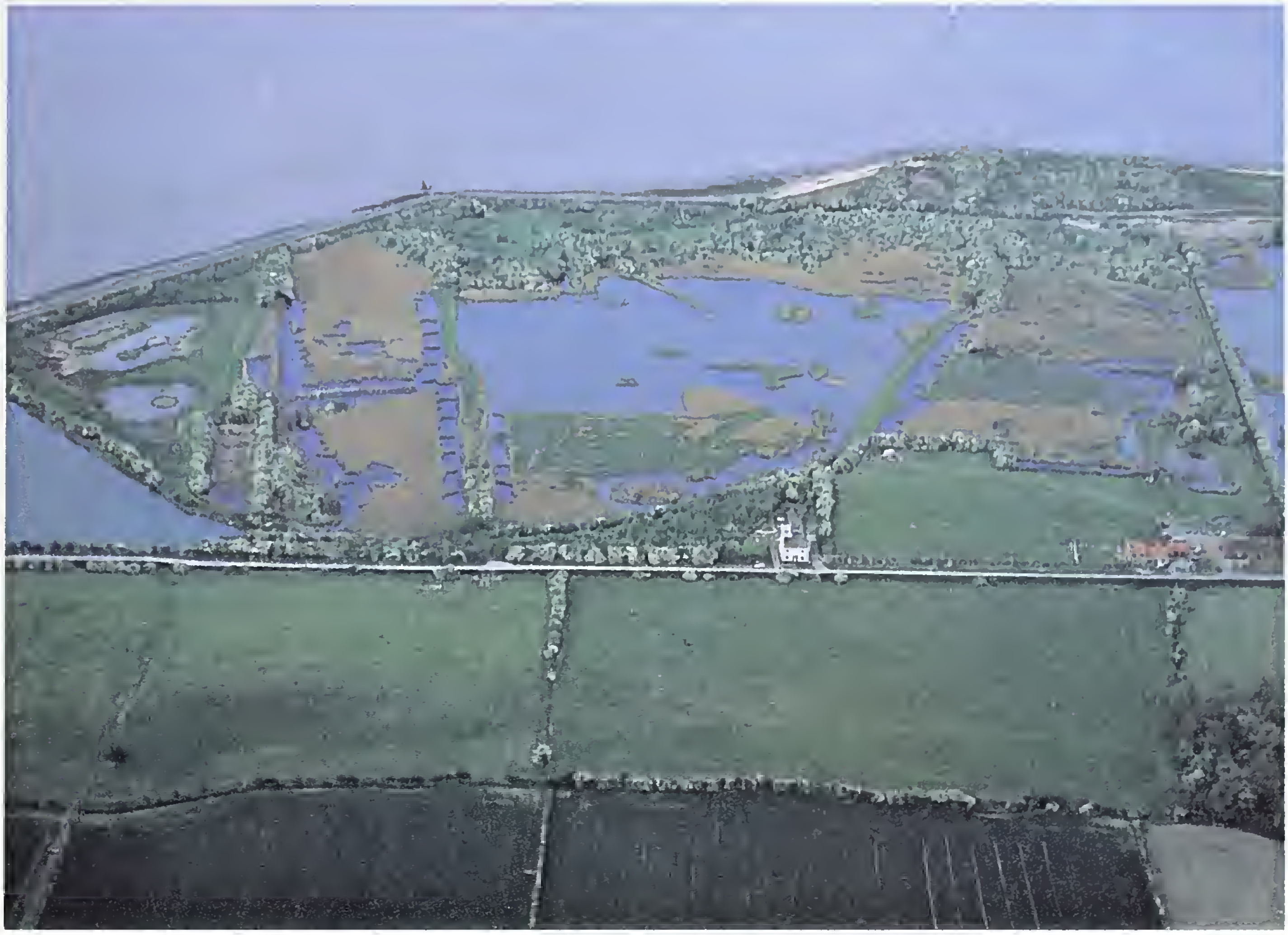


Plate 1 Lincolnshire nature reserves - Far Ings reserve at Barton on Humber in 1995 (page 215)

photo Geoff Trinder

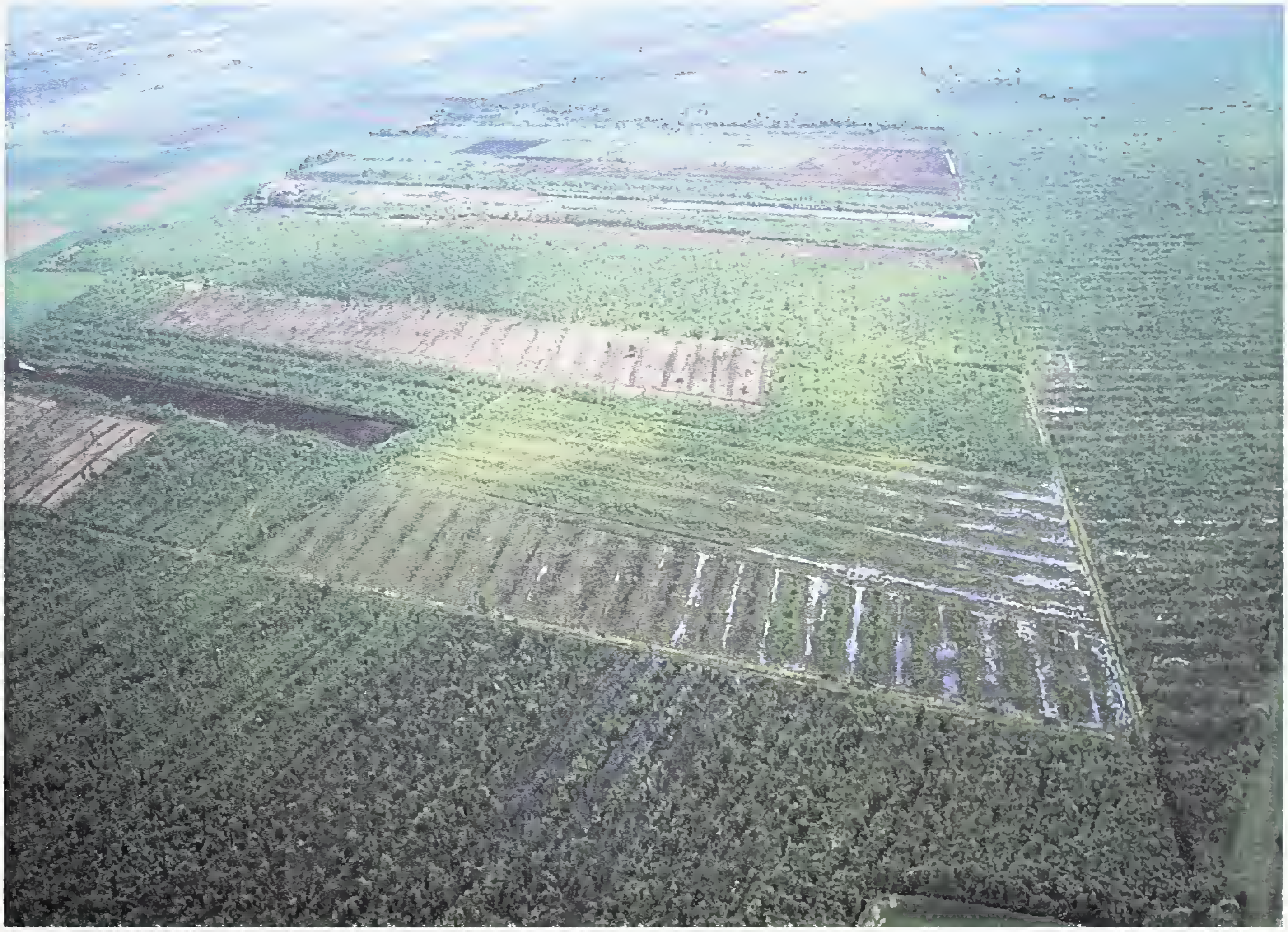


Plate 2 Lincolnshire nature reserves - Crowle Waste reserve (page 213) in 1995

photo Geoff Trinder

Plate 3 Lincolnshire nature reserves - cattle grazing on Baston Fen Marsh (page 212) in 1998 photo Barry Wilkinson

Plate 4 Lincolnshire nature reserves - bluebells at Rigsby Wood (page 222) in 1995 photo Barry Wilkinson

Plate 5 Lincolnshire nature reserves - green-winged orchid at Heath's Meadows, Bratoft in 1984 (page 212) photo Barry Wilkinson

Plate 6 Important species on Lincolnshire nature reserves - all our natterjack toads (page 219) are on reserves. Saltfleetby-Theddlethorpe. photo Roger Key

Plate 7 Important species on Lincolnshire nature reserves - the bearded tit (page 219) is confined to reserves. photo Derrick Robinson

Plate 8 Important species on Lincolnshire nature reserves - breeding grey seals at Donna Nook (page 219) photo Bill Moorcroft

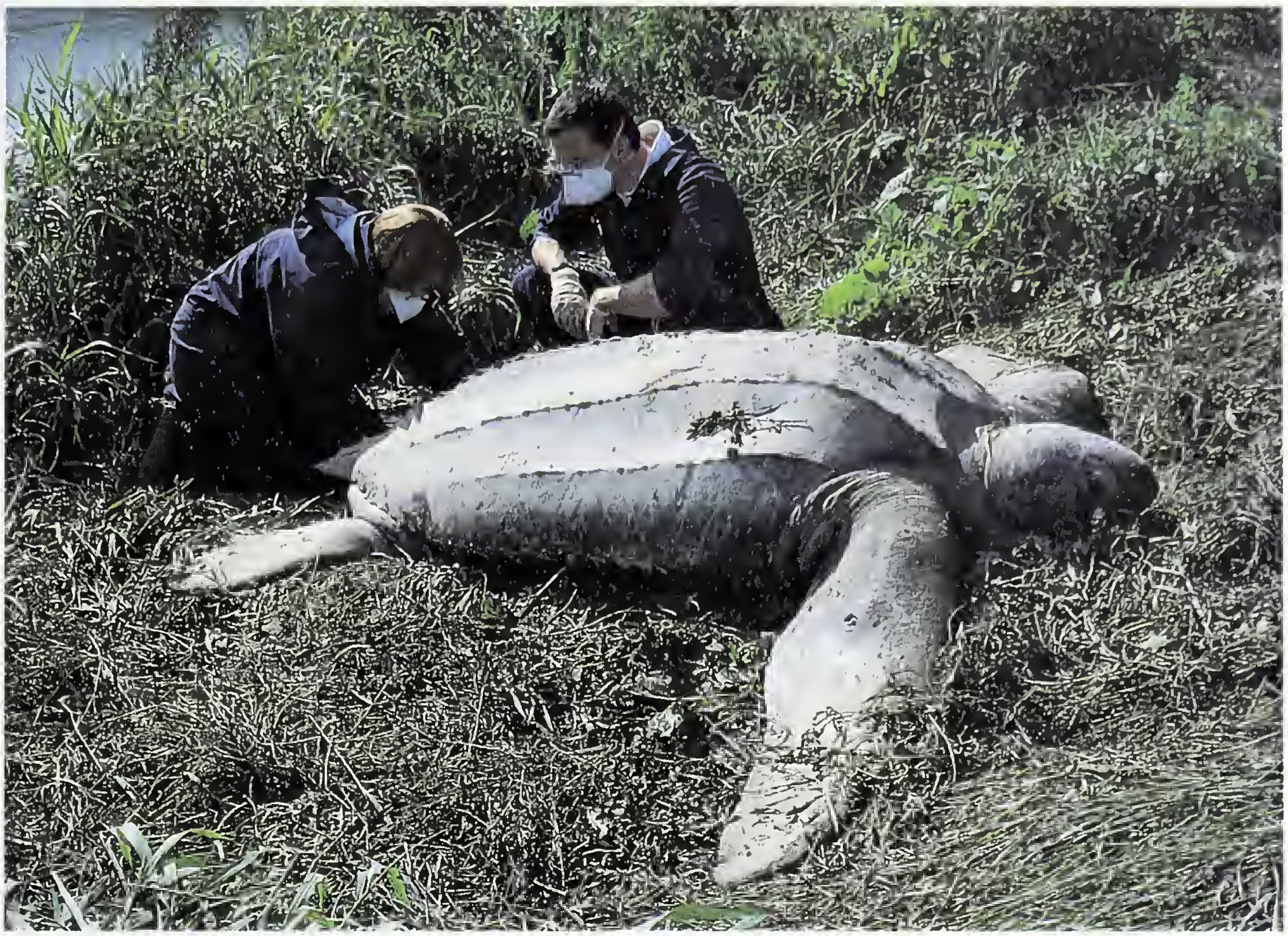


Plate 9 JNCC staff examine the dead leatherback turtle at Spalding (page 242).

photo Ian Reach, JNCC

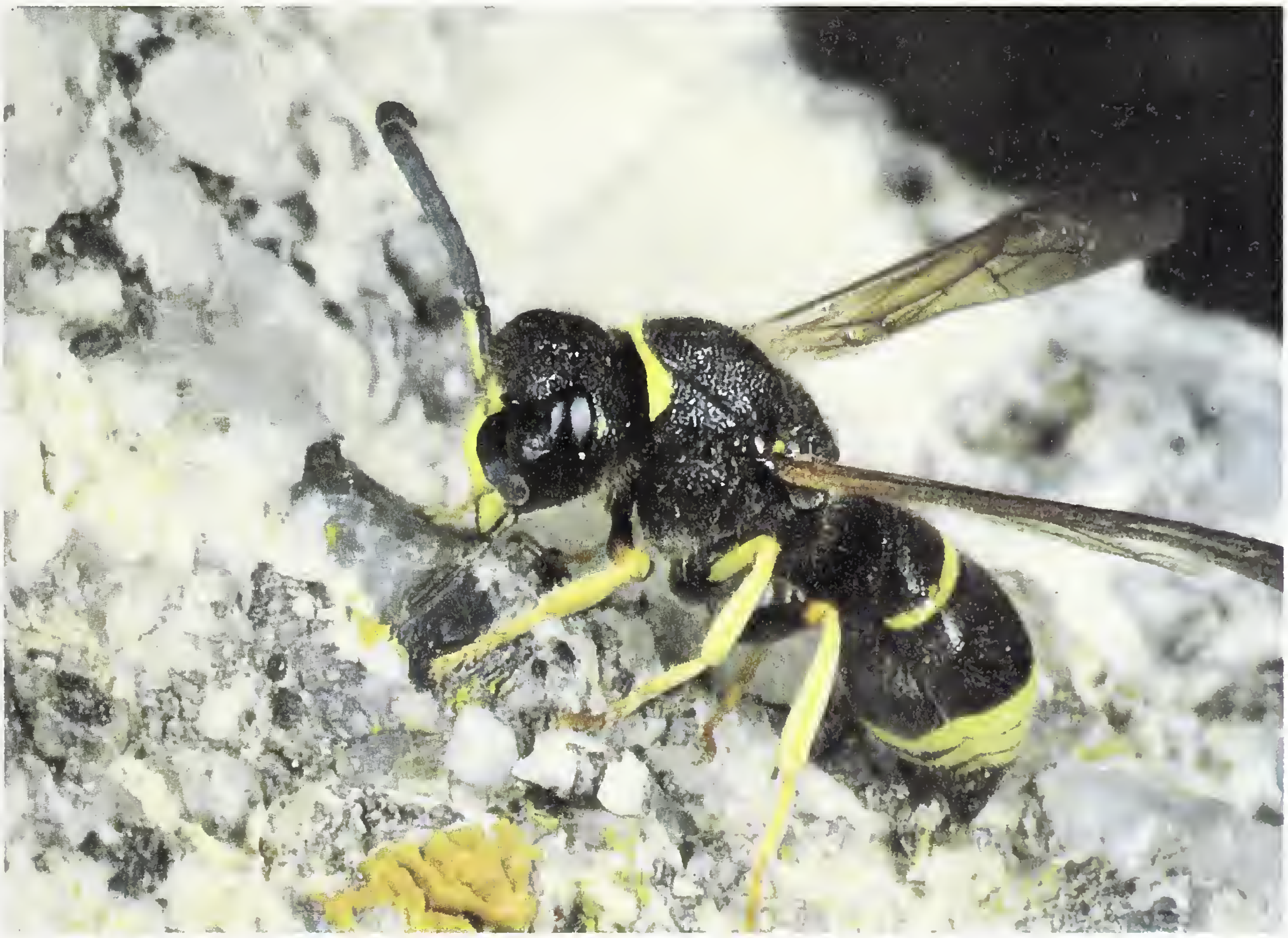


Plate 10 *Ancistrocerus* scoticus is one of the twelve species of mason wasp that occur in Lincolnshire (page 244).

photo Roger Key

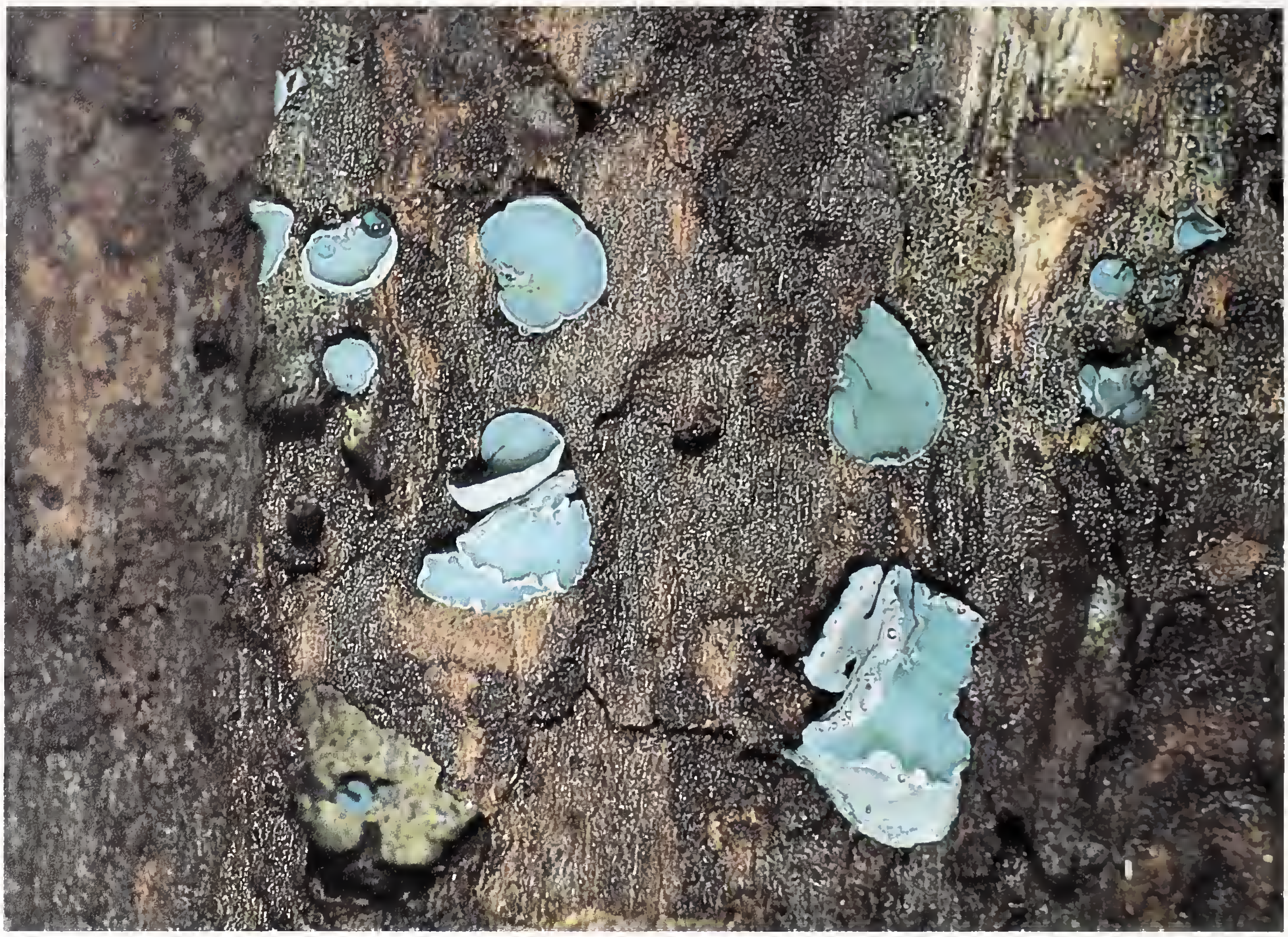


Plate 11 The green wood cup fungus *Chlorociboria aeruginascens* (page 248) at the LNU fungus foray at Clapgate Pits in October. photo Ken Rowland

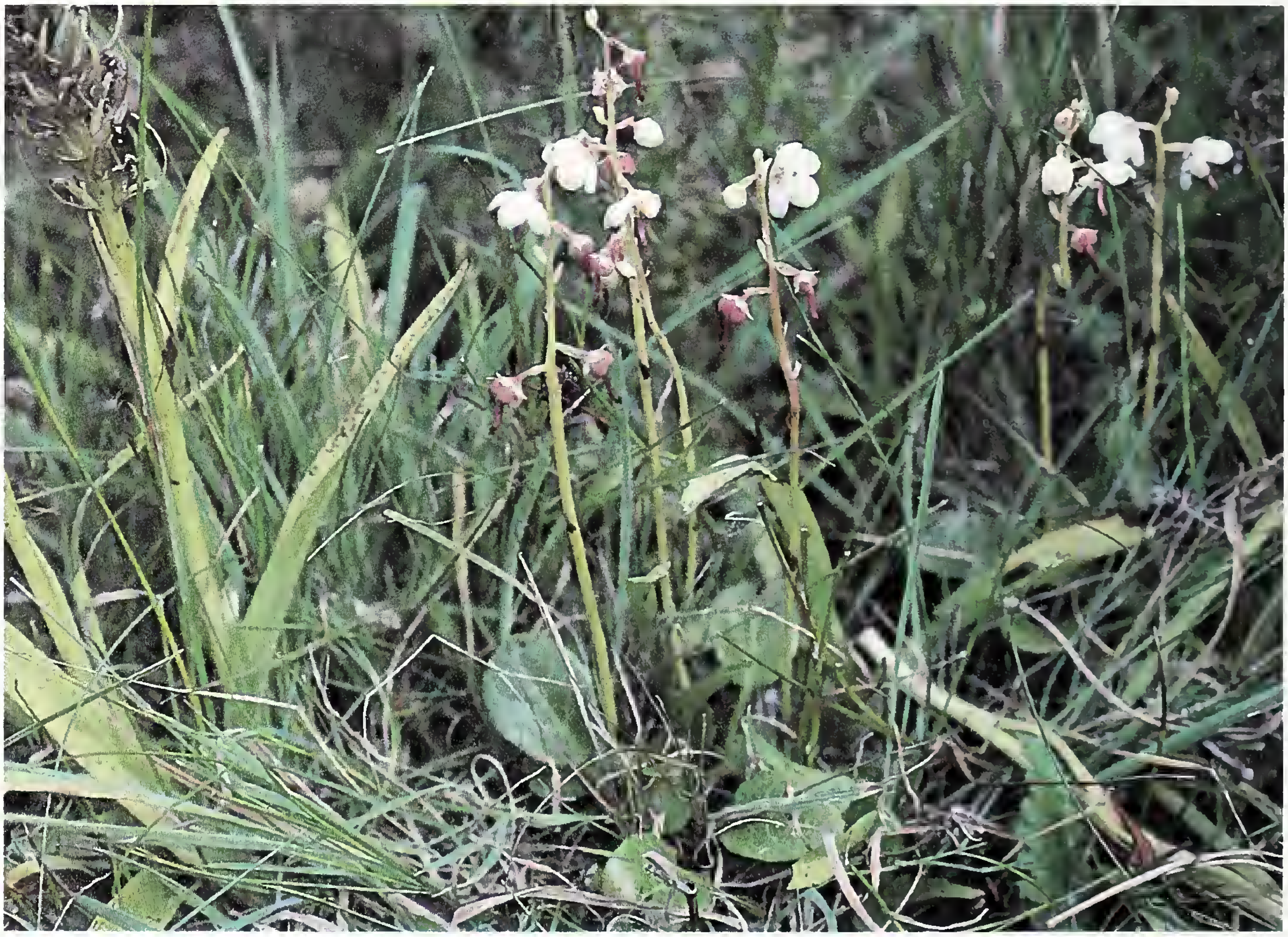


Plate 12 Round-leaved wintergreen *Pyrola rotundifolia*, new to Lincolnshire from Messingham Sand Quarry reserve in 1998. (page 250). photo Rene Weston

Plate 13 Prickly poppy *Papaver argemone* (page 251) was found by Dr Nigel Turnbull on a wall at Caythorpe. photo Rene Weston

Plate 14 The green shield bug *Palomena prasina* (page 253) turned up again in Lincolnshire in 1998, the first time since 1928. photo Geoff Ellis

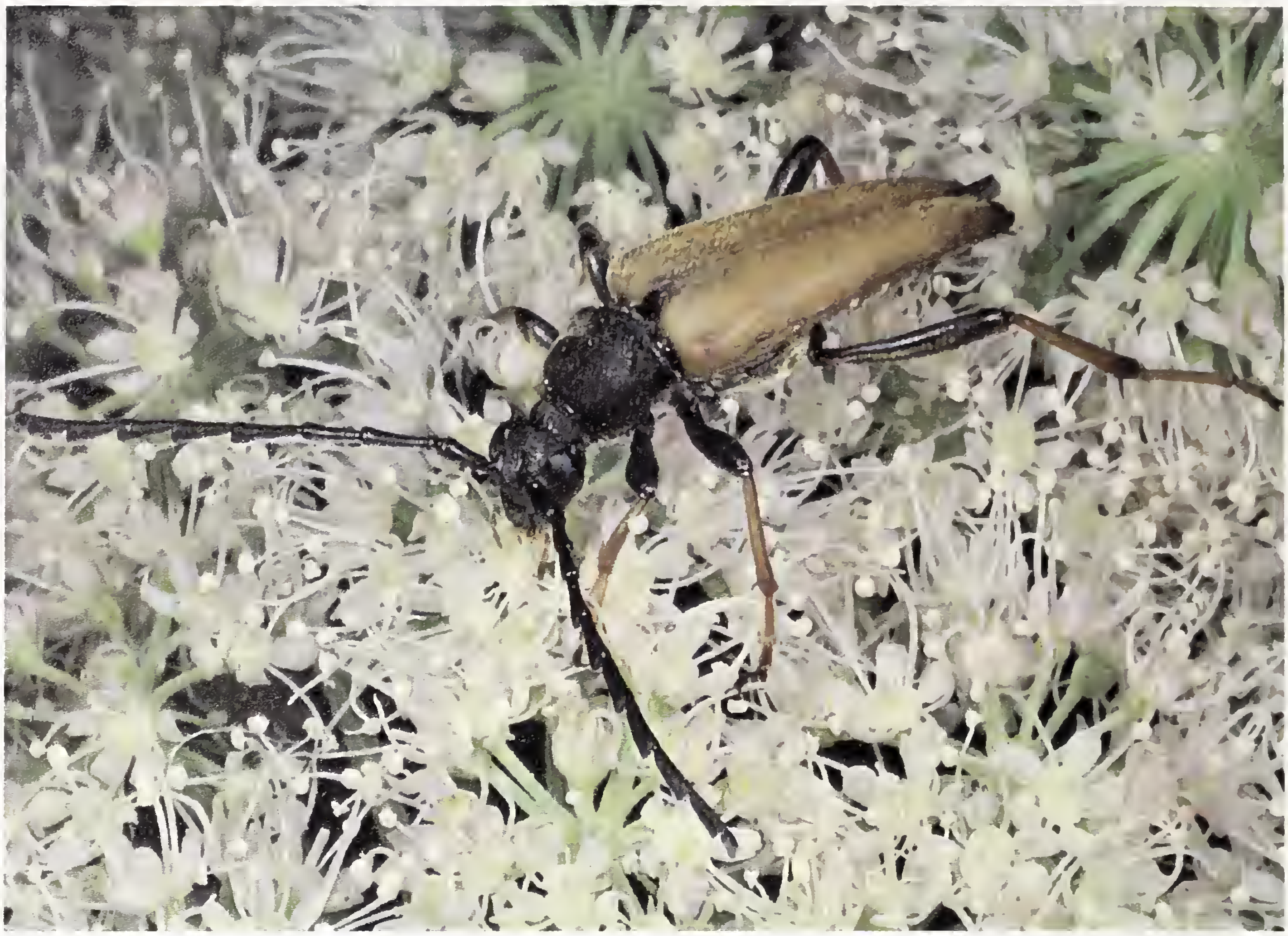


Plate 15 The longhorn beetle *Anoplodera rubra* (page 259) turned up again in Lincolnshire after an absence of many years. photo Roger Key

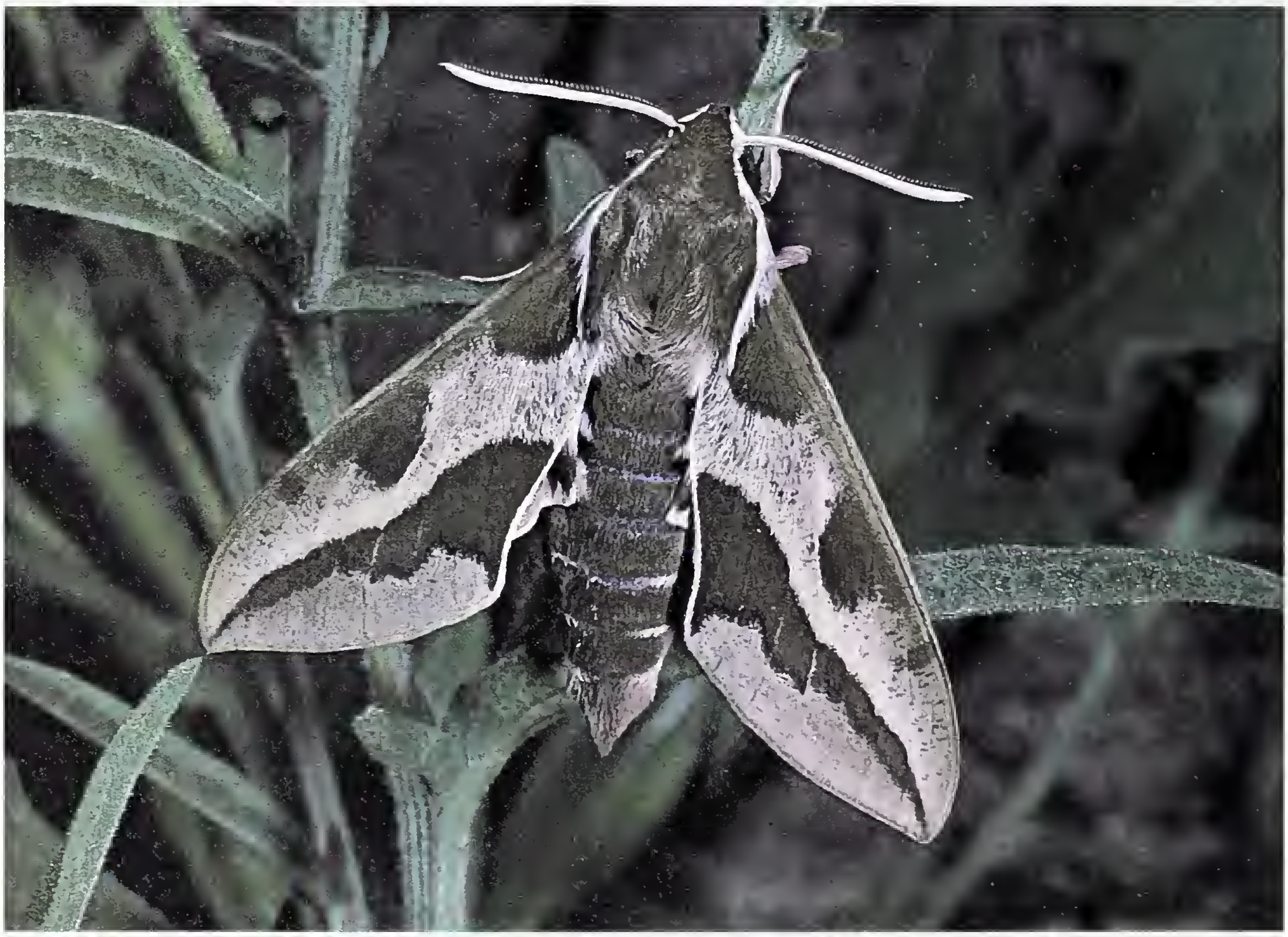
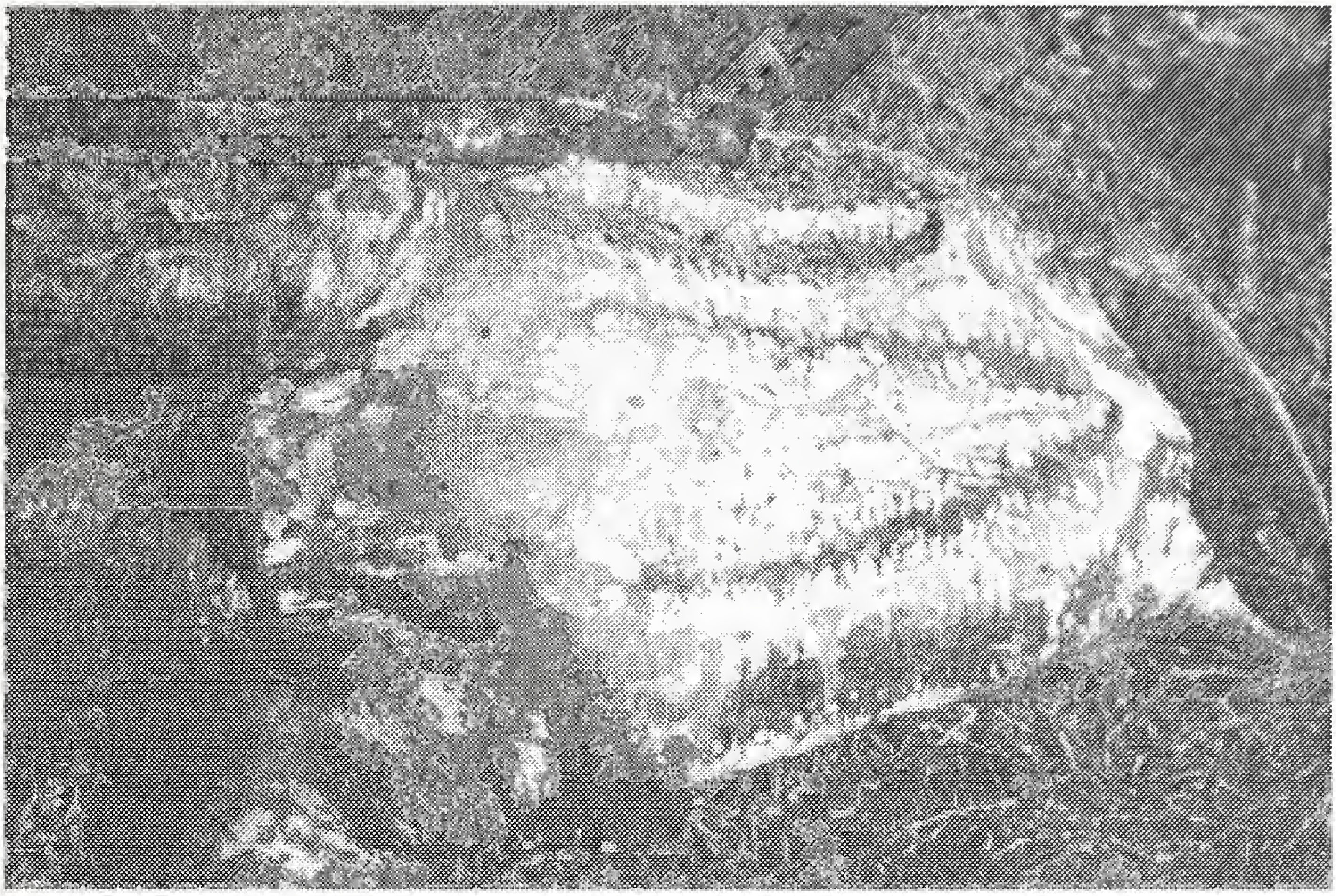


Plate 16 Larvae of the bedstraw hawk moth *Hyles galii* found at Laughton Forest on the August LNU meeting (page 272). photo Rex Johnson

Leatherbacks are the largest turtles in the world and nest on tropical beaches (Davenport & Gaywood, 1997). They forage throughout tropical, subtropical and temperate seas for their main food, jellyfish (and hence easily mistake plastic bags for their food, often with fatal results) and are not infrequent visitors to British and Irish seas, occasionally turning up in the west, especially in Scotland and Wales in recent years. Strandings in eastern counties are unusual, with only the following previous records; Felixstow (1973), Blyth & Cresswell (Northumberland) (1990) and Sizewell (Suffolk) (1998). The Surfleet occurrence provides the first record of this species for Lincolnshire.



Underside of Spalding leathery turtle

photo Ian Reach, JNCC

The body was buried in a domestic waste tip by South Holland Environmental Health department, but the head was removed by Mr B Usher, a taxidermist, and preserved at Baytree Nurseries, Weston. The neck vertebrae, essential in the aging of the species, are deposited with the JNCC.

I am grateful to Alison Littlewood of JNCC and to C. G. McCarthy at The Natural History Museum, London, for additional information and to the Lincolnshire Free Press and Spalding Guardian for publishing the information on the stranding.

References

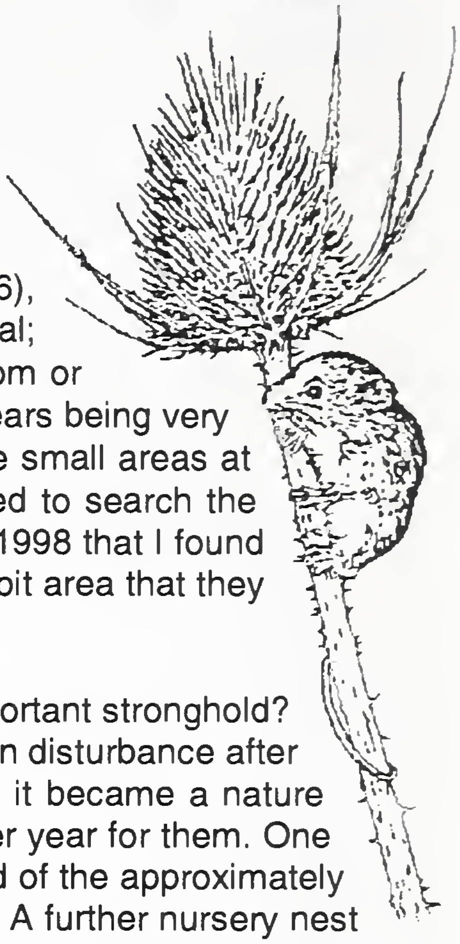
ANON, 1997. Giant turtle spotted in Surfleet. *Spalding Guardian.* Thurs 18th Sept.

DAVENPORT, J. & GAYWOOD, M., 1997. Advice on live, stranded or fouled marine turtles in Scottish waters. *Scottish Natural Heritage Information and Advisory Note* No 91.

FOSTER, J. 1998. Rare east coast leatherback strandings. *Herp-line.* **6**. p5.

HARVEST MICE AT VERNATT'S LOCAL NATURE RESERVE - AN UPDATE

Annette Faulkner



Since originally writing about the harvest mouse *Micromys minutus* at this 1.4 ha. urban reserve in 1995 (Faulkner, 1996), their numbers have fluctuated widely. This is perfectly normal; research has shown their populations to operate on a "boom or bust" principle, some years being very plentiful and other years being very scarce. In 1997, having found no nests for two years in the small areas at either end of their range that is cut each autumn, I decided to search the entire area and found not one nest. It was not until February 1998 that I found the remains of a nest in the second, much smaller, borrow pit area that they use.

1998 was viewed with gloom. Had we lost them from this important stronghold? Were we over-managing the site? Was there too much human disturbance after the tranquillity of their thirty to forty years of peace before it became a nature reserve? Not a bit of it! 1998 has turned out to be a bumper year for them. One nursery nest and four summer nests were found at either end of the approximately 100 metre strip of rough grass and bramble that they prefer. A further nursery nest and two more summer nests were found in an adjacent new area that, in part, is becoming increasingly dominated by reed canary-grass *Phalaris arundinacea* (which they prefer to common reed *Phragmites australis*, perhaps because its growth is much denser). A further nursery nest was found in the reed- and sedge-dominated borrow-pit (again in *Phalaris*), a total of nine nests. I also found a dead female near the latter site. Had we searched the rest of the areas they use, I am sure the total would have been much higher.

Harvest mice are not thought to thrive in wet, cool summers. However, I understand from the Mammal Society that, in 1998, they have also done well at a site in Essex. In our own case, I wonder whether the fact that the two cats that regularly visited the reserve from the nearby housing estate have gone, and that the magpies failed to nest, may have been contributory factors. The grass was also much taller and denser than in the drought years, providing better cover against predators.

Reference

FAULKNER, A. 1996. Harvest mice at Vernatt's Nature Reserve, Spalding. *Lincolnshire Naturalist.* **24**. 24 - 25.

THE MASON WASPS (HYMENOPTERA: EUMENIDAE) OF WATSONIAN LINCOLNSHIRE

Michael E. Archer

The mason wasps (plate 10), which build their nests with clay, are often not noticed by the ordinary observer owing to their small size and solitary habits. We become aware of these wasps when they are found dead inside the house at the bottom of the window through which they had tried unsuccessfully to escape, or are found nesting in old masonry on the outside of the house or in household cavities such as locks.

Mason wasps are predators, hunting the larvae of moths and beetles with which to feed their offspring. The British species are all solitary, with the female of each species searching for a nest site, building a nest of a few cells and provisioning each cell with prey. The only contribution of the male is the insemination of the female. One egg is laid at the end of a thread which is attached at the top of the cell before provisioning starts. Several prey are captured and placed in a cell and the cell sealed so that there is no further contact between the parent and her offspring.

A general introduction to their biology is given in Spradbery (1973) and more elementary accounts in Step (1932) and Andrewes (1969). Fabre (1919) gives an account of his observations which makes compelling reading. Keys to the British species are given in Spradbery (1973), Richards (1980), Yeo and Corbett (1995) and Archer (in prep.).

Most species are associated with a wide variety of open habitats: open woodland, grassland, heathland, moorland, coastal habitats, urban areas (walls, gardens and cemeteries) and disturbed areas (pits, quarries and river banks). The species of *Symmorphus* often are associated with damp places such as streams and ditches.

The Lincolnshire Data

Twelve of the 22 species on the British list have been recorded in the two Lincolnshire vice-counties. Although it is highly unlikely that further species will be added to the Lincolnshire list, much more work is needed to determine the distribution of the twelve species in the county.

Five of the species recorded in Lincolnshire have undergone significant declines nationally since 1970 (Archer, in prep.) and three of these species, *Ancistrocerus antilope, A. nigricornis* and *Symmorphus connexus* are probably now extinct in Lincolnshire. The other two species, *A. oviventris* and *A. scoticus*, have declined, in particular, in midland and southern England and are retreating to the coasts.

The Lincolnshire data consists of 69 records where a record represent a specimen differing in one of the following four variables: species name, sex, locality and day of capture or observation. Records were made at 19 localities (Appendix) which are distributed between the natural areas (refer Weaver, 1998) as follows: North Lincolnshire Coversands and Clay Vale (CCV) (6 localities),Lincolnshire Wolds (LW) (4), Lincolnshire Coast and Marshes (CM) (4), Trent Valley and Rises (TVR) (2), Lincolnshire and Rutland Limestones (LRL) (2) and The Fens (F) (1). The records were made by the following twelve collectors: M.E.Archer (MEA), H.Britten (HB), J.P.Flynn (JPF), C.F.George (CFG), M.W.Graham (MWG), D.S.Hill (DSH), W.G.Hoff (WGH), R.S.Key (RSK), A.S.Lazenby (ASL), E.A.W.Peacock (EAWP), P.Porter (PP) and G.P.Weaver (GPW). I am grateful for being allowed access to their records.

The Records

For each species the records are given in year order. The year of some of the records of Graham are not known, and the year of these records is given as "about 1941" (Graham, 1941). Grid references and natural areas of the localities are given in the appendix.

Odynerus spinipes (Linnaeus, 1758). One record. Scunthorpe, 1901, EAWP.

Ancistrocerus antilope (Panzer, 1798). Four records. Kirton-in-Lindsay, pre-1889, CFG; Old Bolingbroke, 1938, MWG; Salmonby, 1948, MWG.

Ancistrocerus gazella (Panzer, 1798). Eight records. Old Bolingbroke, 1938,1939, MWG; Gibraltar Point, 1989,1997, MEA, 1990, DSH; Blankney Fen, 1992,1994, ASL.

Ancistrocerus nigricornis (Curtis, 1826). Three records. Old Bolingbroke, about 1941, MWG; Grantham, 1951,1972, HB.
Ancistrocerus oviventris (Wesmael, 1836). 13 records. Gibraltar Point, 1990,1995,1996, MEA; Kirkby Moor, 1990,1995,1996, MEA; Rauceby Warren, 1995, MEA; Blankney Fen, 1995, ASL.
Ancistrocerus parietinus (Linnaeus, 1761). Ten records. Old Bolingbroke, about 1941, HWG; Haugham, Louth, 1990, GPW; Nocton Wood, 1990, RSK; Blankney Fen, 1990, ASL; Grebby Hall, Scremby, 1991,1992, WGH; Whisby Nature Park, 1993, PP; Messingham Sand Quarry, 1993, MEA; Kirkby Moor, 1996, MEA.
Ancistrocerus parietum (Linnaeus, 1758). Eight records. Gibraltar Point, 1990, DSH, 1990,1995,1996,1997, MEA; Kirkby Moor, 1996, MEA.
Ancistrocerus scoticus (Curtis, 1826). (plate 10). Four records. Old Bolingbroke, 1939, MWG; Horseshoe Point, 1980, JPF; Gibraltar Point, 1995, MEA.
Ancistrocerus trifasciatus (Muller, 1776). 13 records. Old Bolingbroke, about 1941, MWG; Saltfleetby-Theddlethorpe NNR, 1984, MEA; Grimsby, 1990, JPF; Haugham, Louth, 1990, GPW; Sotby Meadows NR, 1990,ASL; Grebby Hall, Scremby, 1991, WGH; Kirkby Moor, 1992, MEA; Blankney Fen, 1992, ASL; Messingham Sand Quarry, 1993,1995, MEA; Whisby Nature Park, 1994, PP; Rauceby Warren, 1997, MEA.
Symmorphus bifasciatus (Linnaeus, 1761). Three records. Old Bolingbroke, about 1941, MGW; Messingham Sand Quarry, 1989, MEA; Grebby Hall, Scremby, 1992, WGH.
Symmorphus connexus (Curtis, 1826). One record. Woodhall Spa, 1950, MWG.
Symmorphus gracilis (Brulle, 1832). One record. Old Bolingbroke, about 1941, MWG.

References

ANDREWES, Sir C. 1969. *The Lives of Wasps and Bees.* Chatto & Windus, London.
ARCHER, M.E. in prep. *The British Potter and Mason Wasps.*
FABRE, J.H. 1919. *The Mason-Wasps.* Hodder & Stoughton, London.
GRAHAM, M.W. 1941. Hymenoptera, Hemiptera, Neuroptera, Trichoptera, etc., in East Lincolnshire. *Entomologist's Monthly Magazine* **77**, 97-101.
SPRADBERY, J.P. 1973. *Wasps. An account of the biology and natural history of social and solitary wasps.* Sidgwick & Jackson, London.
STEP, E. 1932. *Bees, wasps, ants and allied insects of the British Isles.* Warne, London.
RICHARDS, O.W. 1980. Scolioidea, Vespoidea and Sphecoidea. Hymenoptera, Aculeata. *Handbooks for the identification of British insects*, **6 pt3(6)**. Royal Ent. Society, London.
WEAVER, G. 1997. Natural Areas & Lincolnshire. *The Lincolnshire Naturalist.* **24**. 95-110
YEO, P.F. & CORBET, S.A. 1983. *Solitary Wasps.* Second edition. Naturalists' Handbooks, 3. Richmond Publishing, Slough.

Appendix - The grid references and natural areas of localities. The location of some localities (3,9,12,14,16,19) is unknown, so that the grid references for these localities can only be approximate.

1. Blankney Fen. TF1262. F.
2. Gibraltar Point TF5557. CM.
3. Grantham. SK9136. TVR.
4. Grebby Hall, Scremby. TF4368. LW.
5. Grimsby (Hainton Avenue). TA2708. CM.
6. Horseshoe Point. TA3801. CM.
7. Haugham, Louth. TF3381. LW.
8. Kirkby Moor. TF2262. CCV.
9. Kirton-in-Lindsey. SK9398. CCV.
10. Messingham Sand Quarry. SE9103 CCV.
11. Nocton Wood. TF0863. LRL.
12. Old Bolingbroke. TF3564. CCV.
13. Rauceby Warren. TF0343. LRL.
14. Salmonby. TF3273. LW.
15. Saltfleetby-Theddlethorpe NNR. TF4791. CM.
16. Scunthorpe. SE8910. CCV.
17. Sotby Meadows NR. TF2077. LW.
18. Whisby Nature Park. SK9166. TVR.
19. Woodhall Spa. TF1963. CCV.

LINCOLNSHIRE NATURAL HISTORY IN 1998

A most peculiar year. January, February and March were very mild and dry, with record warm temperatures of over 15°C in February, followed by a promising early spring. April started with typical April showers, the first for in April for several years. By mid April, things changed, with prolonged very cold temperatures, deluges of rain which led to extensive flooding in the south west of the county. May was excessively cool and wet, but with a very warm, summery fortnight in the middle of the month. June was the wettest on record and very cool and low temperatures continued into July. Summer seemed to come at last in the first weeks of August, but we were back to cool and moist in the latter half of the month. September gave us a brief Indian summer, warm and humid with little rain. October to December were cool, wet and grey, with extensive freezing fogs in November and about a week of sharp frosts in mid December. The year went out with almost hurricane force winds on Boxing Day with torrential rain.

Statuses referred to for invertebrates are as given in the Recorder biological recording package.

Record Acknowledgements

As always, the county recorders have acknowledged a debt of gratitude to all who have taken the time and effort, very considerable in some cases, to submit records. There are so many who send in records of different groups of animals and plants that Individual recorders are now acknowledged together to avoid duplication: ME Archer, G Askew, E Barnard, HE Beaumont, A & AE Binding, S Botham, A Brackenbury, K Bradshaw, D Bromwich, D Brown, JH Clarke, A Credland, BJ Cunnington, J Davison, ME Dawson, C Dobson, G Ellershaw, AM Emmet, T Evans, D Fairchild, A & C Faulkner, S. Fleming, AJ Gardiner, OL Gilbert, A Godfrey, N Goom, S Green, Z Harris, Mr & Mrs Harvey, K. Heath, WG Hoff, C Howes, J Jaines, ANA Johnson, M Johnson, R Johnson, WJ Johnson, RS & RJ Key, P King, P Kirby, J Kneeshaw, D Knight, V Knight J Lamin, FR Lammiman, R Lidstone-Scott, S Meek, A McGowan, Mr & Mrs Morrish, J. Ostler, J Petyt, P Porter, C Potts, I Redding, EJ Redshaw, C Rieser, KD Robertson, R Rowe, K Rowland, R Saunders, C Sergeant, KJ Seaton DA Sheppard, K Skelton, B Skinner, C Smith, T Smith, G. Taylor, J Turner, J Watts, G Weaver, I Weston, V Wilkin, KMS Wilson, PJ Wilson, G Wright.

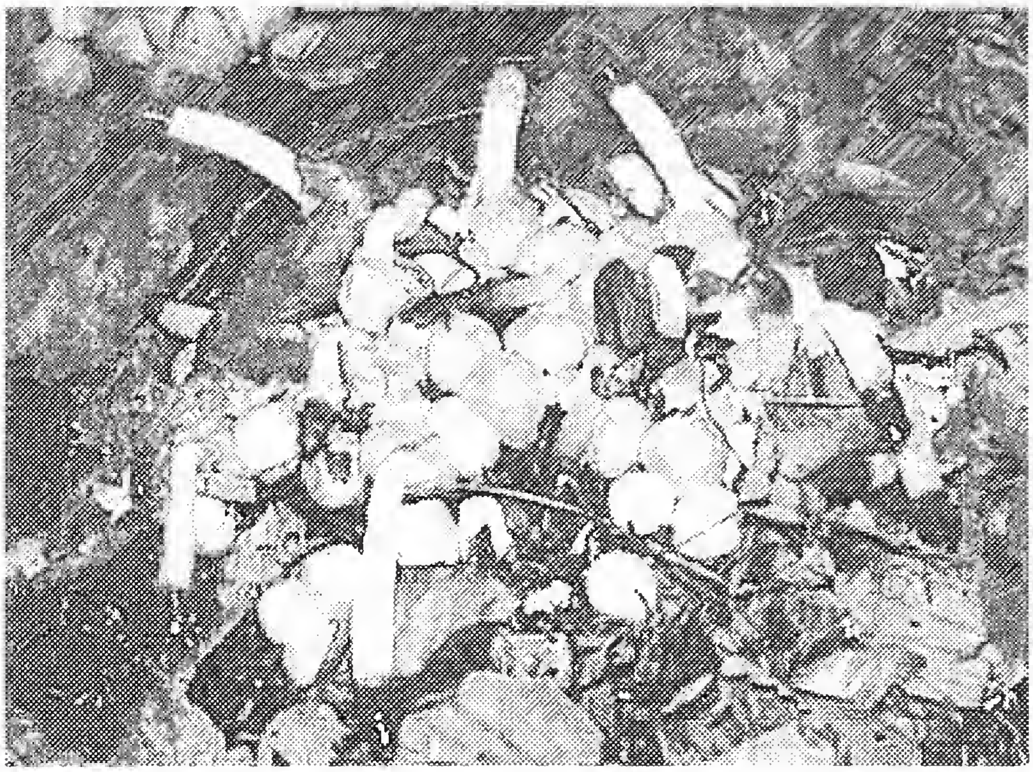
FUNGI - Ken Rowland

1998 was not the year of the fungus - the wet June and October did not bode well for the season and, in fact, some fungi started to appear in July then disappeared again. Fly agarics were in very small numbers as were the *Russula* and *Lactarius* species; indeed nothing was plentiful. The year as a whole has been very mixed some sites only yielding about 50% of their normal species. However, over the year I have had over 1750 records for 111 different sites with in the region of twenty new county records.

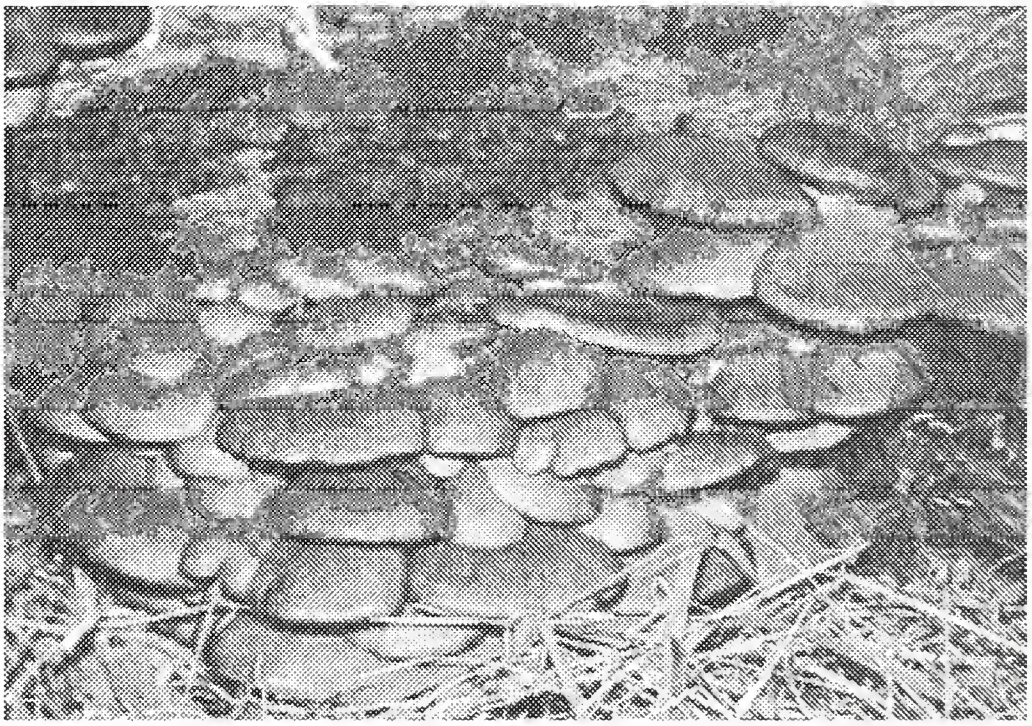
At a Watch Group Meeting in at Ancaster churchyard on 30th June was the rust *Puccinia distincta* on daisy *Bellis perennis*. This rust is relatively new to Great Britain and is spreading rapidly and it was probably at Swanholme last year but I misnamed it at that time and I am awaiting confirmation from the British Mycological Society.

At Laughton Forest on 16th August, we made 28 species records at Rose's Plantation, (of which 20 were new site records, showing how little recording had been done before), while at on the Forest Enterprise part of Scotton Common 23 species were recorded with 2 new site records. The cup fungus *Peziza ampliata* on a bonfire site was an interesting find. At Laughton Common 21 species were found, of which 2 were new site records, the most interesting being *Ceriporioporus gilvescens* a resupinate which turns bright red at the edges when damaged. Linwood Warren on 13th September is another well recorded site and 74 species were found including 16 new site records.

153 species were recorded on the Fungus Foray at Broughton Woods on 18th October, encompassing four sites; Clapgate Pits, where 25 species were recorded including the green wood cup *Chlorociboria aeruginascens* (plate 11) which, although commonly found staining wood green, is unusual to find in fruit. Rowland Plantation, with 6 species recorded, and Broughton Far Wood with 39 species recorded, including the earth star *Geastrum fimbriatum.* 84 species were recorded at Broughton West Wood including 2 new county records; *Cerocorticium confluens* a waxy grey resupinate and *Hymenoscyphus rokobyensis* a cup fungus on old beech cupules. Two unusual species were the magpie fungus *Coprinus picaceus* and a very interesting 'clutch' of the dog stinkhorn *Mutinus caninus*. There are over a hundred old records attributed to Broughton Wood, mostly from Rev W. Fowler at a meeting of the LNU in 1895, but which part of the wood it was is unclear and so they are kept as a separate entry.


Dog stinkhorn *Mutinus caninus* at Broughton Far Wood photo Ken Rowland

At the end of the year my neighbour David Knight found a very large collection of the blue-grey version of oyster mushroom *Pluerotus ostreatus* in mid December at Skellingthorpe, with about four or five hundred fruit bodies on an old beech trunk, keeping him happy for a long time both photographically and gastronomically!


Large and tasty crop of oyster mushroom, *Pleurotus ostreatus* at Skellingthorpe photo Ken Rowland

MOSSES, LIVERWORTS AND LICHENS - Mark Seaward

Further lichenological work was undertaken in 1998 as part of the British Lichen Society's churchyard survey: in all, a further 16 churches were investigated. The most remarkable find was *Ramalina capitata* from Baumber, the first record for England and possibly for the

British Isles since, of the two 19th century collections from Scotland, one (Portlethan, Kincardineshire) is only probable, while the other (Beinn a'Bhuird, Aberdeenshire) is doubtful. At the Lincolnshire site, this rare lichen occurs on five Yorkshire grit tombstones. Although abundant on one stone, its continuing presence on this and the other stones is tenuous. To date, 234 Lincolnshire churches in 88 10km squares have been surveyed.

My research at Risby Warren since 1963 has shown the remarkable recovery in the lichen flora there as a consequence of a significant reduction in the pollution burden and my survey of the Swanholme Park Nature Reserve near Lincoln resulted in the discovery of establishing colonies of terricolous lichen communities composed of 13 *Cladonia* taxa (including *C.sulphurina*, a very rare species in England south of the Humber), with, at one site, *Coelocaulon aculeatum*. Several oak trees in the neighbouring Hartsholme Country Park have been recolonised by epiphytic lichens, one trunk supporting 10 foliose and fruticose species, including *Evernia prunastri*, *Parmelia caperata*, *P.revoluta*, *Ramalina farinacea* and *Usnea subfloridana*, testifying to the significant improvement in air quality since I last visited this site nearly 10 years ago.

In the light of all the above lichenological work, 6 county, 7 vice-county (6 for N.Lincs. and 7 for S.Lincs.), 63 divisional and many grid square records have been added.

Mainly due to the invaluable work of Frank Lammiman and Christine Rieser, numerous bryophyte records were also added. Their most notable finds included *Anomodon viticulosus*, (first record for VC54 since 1914 and only the second record for the county since then), *Campylium polygamum*, (first record for the county since 1932), *Dicranum montanum,* (first record for VC54 since 1913), *D.tauricum* (new to VC54), *Eurhynchium pumilum* (first record for the county since 1951), *Ulota crispa* var. *norvegica* (first record for VC54 since 1913), *Chiloscyphus pallescens* (first record for VC54 since 1931) and *Ptildium pulcherrimum* (new to VC53 and the first record for the county since 1924).
The following records have been contributed O.L.Gilbert (OG), P.Kirby (PK), F.R.Lammiman (FL), C. Rieser (CR) and by the author if not otherwise stated.

Mosses

Bryum pseudotriquetrum (Hedw.) Schwaegr. 10 FL CR
Campylium polygamum (Br.Eur.) J.Lange & C.Jens. 2 FL & CR
Dicranum montanum Hedw. 8 FL & CR
D.tauricum Sapehin 7 CR **VCR**
Drepanocladus aduncus (Hedw.) Warnst. 14 FL CR
Ephemerum recurvifolium (Dicks.) Boul. 11 FL CR
Eurhynchium pumilum (Wils.) Schimp. 3 CR
Fissidens cristatus Wils.ex Mitt. 3 FL CR
F.incurvus Starke ex Röhl. 3 7 11 FL CR
Isothecium myosuroides Brid. 8 FL
Phascum curvicolle Hedw. 11 FL CR
Platygyrium repens (Brid.) Br.Eur. 8 FL CR **VCR**
Pottia recta (With.) Mitt. 11 FL CR
Sphagnum subnitens Russ & Warnst. 7 FL CR
S.tenellum (Brid.) Brid. 7 CR
Tortula latifolia Bruch ex Hartm. 8 FL CR
Trichostomum crispulum Bruch 8 FL CR
Ulota crispa (Hedw.) Brid. 11 FL CR
U.crispa var. *norvegica* (Groenvall) Smith & Hill8 CR

Liverworts

Aneura pinguis (L.) Dum. 5 8 11FL, CR PK
Calypogeia arguta Mont.& Nees 11 FL CR
C.muellerana (Schiffn.) K.Müll. 5 PK
Chiloscyphus pallescens (Ehrh.ex Hoffm.) Dum. 8 FL
C.polyanthos (L.) Dum. 11 FL CR
Diplophyllum albicans (L.) Dum. 4 FL CR
Frullania dilatata (L.) Dum. 8 FL
Ptilidium pulcherrimum (G.Web.) Vainio 13 FL CR **VCR**
Riccia fluitans L. 2 FL
Ricciocarpos natans (L.) Corda 9 FL CR

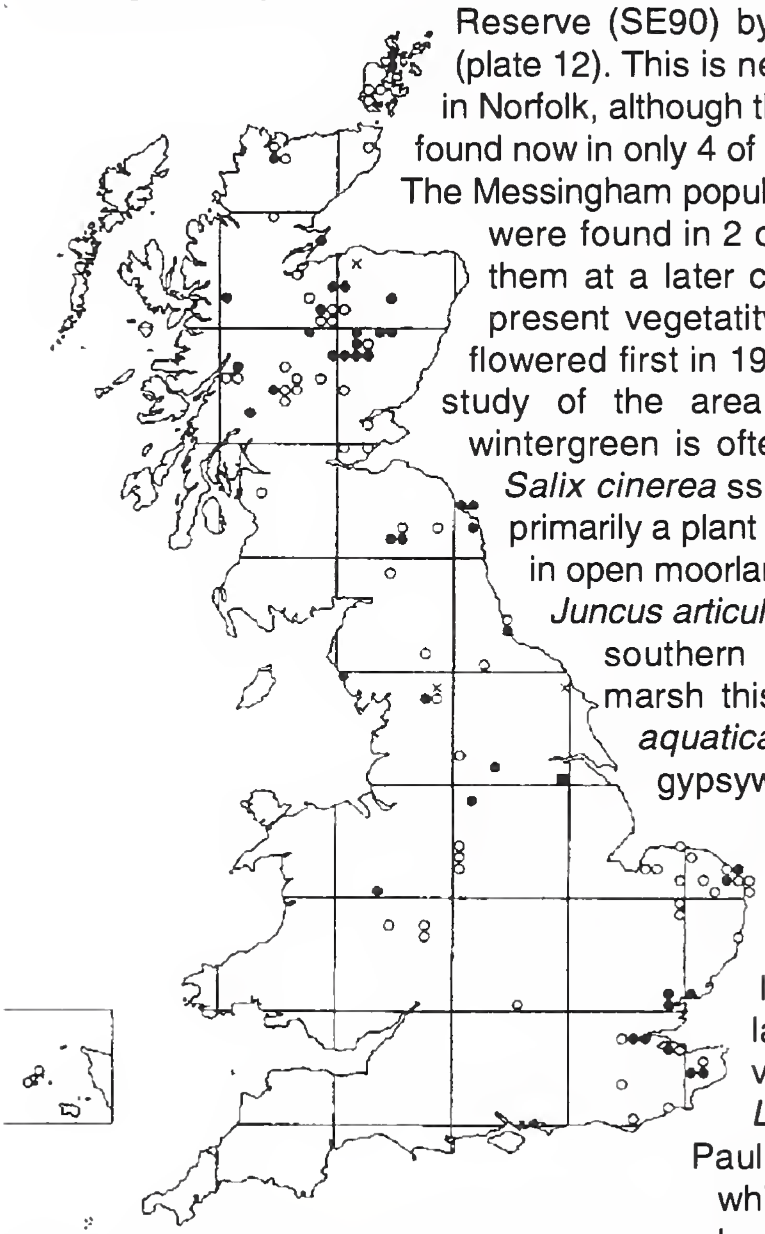
Lichens

Acarospora smaragdula (Wahlenb.) Massal. 3
Agonimia tristicula (Nyl.) Zahlbr. 17
Aspicilia contorta (Hoffm.) Krempelh. 8
A.subcircinata (Nyl.) Coppins 3 (First record for N.Lincs. since 1879)
Belonia nidarosinensis (Kindt) P.M.Jörg.& Vezda 15, 18
Buellia aethalea (Ach.) Th.Fr. 15
Caloplaca crenulatella (Nyl.) H.Olivier 10 **NCR** OG
C.flavovirescens (Wulfen) Dalla Torre & Sarnth. 10
Catillaria chalybeia (Borrer) Massal. 10
Cladonia cariosa (Ach.) Sprengel 2 **NCR**
C.crispata v *cetrariiformis* (Delise ex Duby) Vainio 13**VCR**
C.diversa Asperges 2, 13 (Previous Lincs records of *C.coccifera* probably refer to this taxon)
C.glauca Flörke 13 **VCR**

C.portentosa (Dufour) Coem. 13 **VCR**
C.ramulosa (With.) Laundon 7(1997), 13
C.sulphurina (Michaux) Fr. 13 **NCR**
Clauzadea metzleri (Körber) Clauzade & Roux ex D.Hawksw. 2 **VCR**
Cliostomum griffithii (Sm.) Coppins 17
Coelocaulon aculeatum (Schreber) Link 13 **VCR**
Collema tenax var. *ceranoides* (Borrer) Degel. 13
Diploschistes scruposus (Schreber) Norman 7
Evernia prunastri (L.) Ach. 5
Haematomma ochroleucum (Necker) Laundon var. *ochroleucum* 5
Lecanora conferta (Duby ex Fr.) Grognot 2
L.pannonica Szat. 2, 5, 15, 16, 17
Leproplaca chrysodeta (Vainio ex Räsänen) Laundon 5
Micarea lignaria (Ach.) Hedl. 2
M.misella (Nyl.) Hedl. 5 **NCR**
Mycoblastus sterilis Coppins & P.James 15
Ochrolechia parella (L.) Massal. 15 **VCR**
Parmelia caperata (L.) Ach. 13
P.glabratula (Lamy) Nyl. 5, 13
P.glabratula ssp. *fuliginosa* (Fr.ex Duby) Laundon 16
P.revoluta Flörke 13
P.subaurifera Nyl.5
P.subrudecta Nyl. 5
P.verruculifera Nyl. 3, 8
Parmeliopsis ambigua (Wulfen) Nyl. 5
Placynthiella dasaea (Stirton) Tönsb. 5 **NCR**
P.icmalea (Ach.) Coppins & P.James 5
Porpidia soredizodes (Lamy ex Nyl.) Laundon 15
Protoparmelia badia (Hoffm.) Hafellner 15 **VCR**
Psilolechia leprosa Coppins & Purvis 15
Ramalina capitata (Ach.) Nyl. **NCR**
R.farinacea (L.) Ach. 5
Scoliciosporum chlorococcum (Graewe ex Stenhammar) Vezda 15
Trapelia involuta (Taylor) Hertel 2
T.placodioides Coppins & P.James 2, 3
Usnea subfloridana Stirton 5, 8
Verrucaria baldensis Massal. 5
V.macrostoma Dufour ex DC. 5, 15

BOTANICAL NOTES - Irene Weston

Without doubt the most significant find of 1998 was the discovery of round-leaved wintergreen *Pyrola rotundifolia* L. ssp. *rotundifolia* at the Messingham Sand Quarry Reserve (SE90) by Frank Lammiman and Christine Reiser (plate 12). This is new to Lincolnshire, the nearest sites being in Norfolk, although the populations there are diminishing, being found now in only 4 of the former 15 sites (Beckett & Bull, 1999). The Messingham population is obviously expanding, 45-50 plants were found in 2 colonies 2-3 metres apart. I photographed them at a later confirmatory visit. These must have been present vegetatitvely for a few years earlier, but probably flowered first in 1998 - they were not seen during a detailed study of the area by Vi Wilkin in 1997. Round-leaved wintergreen is often recorded with willows and grey willow *Salix cinerea* ssp *cinerea* is found nearby. In England it is primarily a plant of scrubby fens, but in Scotland it is found in open moorland. Associated species include jointed rush *Juncus articulatus,* blunt-flowered rush *J. subnodulosus,* southern marsh orchid *Dactylorhiza praetermissa,* marsh thistle *Cirsium palustre,* water mint *Mentha aquatica,* marsh pennywort *Hydrocotyle vulgaris,* gypsywort *Lycopus europaeus,* yellow sedge *Carex viridula* ssp. *oedocarpa*, marsh horsetail *Equisetum palustre* and shoreweed *Littorella uniflora.*



Pyrola rotundifolia pre and post 1970 records with recent Lincolnshire record added. Map from Stewart et al (1994).

In 1997 Stewart Fisher noted a strange sea lavender at Frampton Marsh which was very similar to lax-flowered sea lavender *Limonium humile.* In 1998 Lewis James, Paul Kirby and Irene Weston found the plants which were mixed with the common sea lavender *Limonium vulgare.* The plants stood apart from the common sea lavender and were identified subsequently by Dr Lauri Boorman (the BSBI *Limonium* referee) and Dr Tim Rich of the National Museum of Wales as *Limonium vulgare* var *pyramidale*, a variety new for Lincs. Lax-flowered sea lavender has been recorded before in Lincs (Frampton in 1951 and 1973 (Gibbons and Weston, 1985)) but the records are now suspect. All that have been investigated have now been shown to be the more common species. The diagnosis depends on the microscopical examination of the stigmas and pollen grains. Swards of *Limonium humile* in south-east England are nearly always of single species and not mixed with *L. vulgare*. Spiral tasselweed *Ruppia cirrhosa* (=*spiralis*) was also rediscovered in the area. Previous sites in this area have gone, but in 1998, three large colonies, one filling a pond, were noted. It has been recorded by J & J Stobart and T Davey and recently by Richard & Kaye Heath and myself since it was presumed extinct in Smith (1988). Its earlier sites were destroyed and latter records are from other areas.

In Gibbons (1975), white ramping fumitory *Fumaria capreolata* and common ramping fumitory *F. muralis* were both described as unconfirmed for Lincolnshire with the single records doubted as "out of range". In 1998 both species were recorded whilst "square-bashing" for the Atlas 2000 project by myself, Vi Wilkin Paul Kirby and Zella Harris. *F. capreolata* was from Ludborough (TF29) and *F.muralis* from near Thorpe-on-the-Hill (SK86). Both have been examined and confirmed by Eric Clement of the BSBI. *F.capreolata* was found with heart's-tongue fern *Phyllitis scoparia*, new to the area, near an old brick wall.

Paul Kirby has rediscovered about 20 plants (some quite large) of black bog-rush *Schoenus nigricans* in Laughton Forest, scattered along 100 metres of ditch behind a forest track. It is a rare plant of calcareous bogs and the habitat is extremely diminished in the county. It has not been recorded since 1960, although was previously in a number of other localities (Isle of Axholme 1815, Crosby 1875, Aylesby 1923, Waddingham 1937, Bigby 1894, Bourne 1836, Scotton 1887-1960).

Dr Nigel Turnbull has published a booklet "Flowers of the Bourne Area" (Turnbull, 1998) as a tribute to the late Miss Doreen Hunt with whom he worked the area. Copies are available from Dr. Turnbull at Bourne. He has recorded prickly poppy *Papaver argemone* (plate 13), which has not been recorded for some time. It was recorded recently in quantity on the top of a large wall on the Caythorpe corner, together with rustyback fern *Ceterach officinalis*, fern grass *Catapodium rigidum*, pellitory-of-the-wall *Parietaria judaica* and rue-leaved saxifrage *Saxifraga tridactylites,* but is still very rare.

Wild radish *Raphanus raphanistrum* ssp *raphanistrum* - was reported last year as being in decline (Weston, 1998), but has cropped up this year in a number of localities, nearly all roadside developments, in quantity on both the Lincoln and Grimsby bypasses, always where there has been a lot of disturbance.

Shepherd's needle *Scandix pecten-veneris* has been found at Baumber (TF27) by Claire Harrison, who continues to record rare arable weeds on the farm.

Golden dock *Rumex maritimus* has been recorded from the Trust Reserve at Whisby. There is an old record for the area but it had not been seen recently.

Mistletoe *Viscum album* has been recorded in Lincoln city on poplar by Geoff Taylor. Bill Hoff has successfully introduced mistletoe to Grebby Hall, one plant on apple and one on hawthorn. Both are thriving but propagation has been difficult. The mistletoe at Grimsthorpe is remarkable in the number of host plants it parasitises. It is rarely found on lime but at Grimsthorpe it is endangering the lime trees.

Mrs Rachel Gibbons, working on a Trust survey project on the Cleethorpes dunes, has found both giant ragweed *Ambrosia trifida* and hoary mustard *Hirschfeldia incana*. Both are new to North Lincolnshire and hoary mustard was found elsewhere later in the year. Dr Tim Rich's determinative letter wondered why it has not been recorded before. It is, however, so distinctive with fruits rather like an old fashioned clothes-peg, and is unlikely to have been missed, particularly in that area where casuals and aliens have been so well worked. There is a single old record for a casual occurrence in South Lincs in 1899. Other rare plants in the Cleethorpes dunes, bulbous meadow-grass *Poa bulbosa*, saltmarsh flat-sedge *Blysmus rufus*, long-bracted sedge *Carex extensa* and dense silky-bent *Apera interrupta*, continue to flourish.

The salt-loving subspecies of thrift *Armeria maritima* has been seen in two places on the roadside near Wragby TFl7.

Shaggy and gallant soldiers, *Galinsoga quadri-radiata* and *G. parviflora* were recorded this year as new square records at SK95 (Bassingham) SK36 (Swinderby) respectively. These alien species seem to have declined recently. Another much more invasive alien, common fiddleneck *Amsinckia micrantha* is increasingly recorded all over the county particularly on sandy soils. It was first recorded from Burwell 1972.

Common fiddleneck *Amsinckia micrantha*, an invasive plant on dry sandy dry soils throughout the county. photo Roger Key

References

BECKETT, G. & Bull, A. 1999. *A flora of Norfolk*. published privately by G Beckett.
GIBBONS, E.J. 1975. *The flora of Lincolnshire.* Lincolnshire Natural History Brochure № 6. Lincolnshire Naturalists' Union. Lincoln.
GIBBONS, E.J. & WESTON, I. 1985. *Supplement to the flora of Lincolnshire*. Lincolnshire Natural History Brochure № 11. Lincolnshire Naturalists' Union. Lincoln.
SMITH, A.E. (ed.) 1988. *Endangered wildlife in Lincolnshire and South Humberside. A Red Data Report.* Lincolnshire & South Humberside Trust for Nature Conservation. Alford.
TURNBULL, N. 1998. *Flowers of the Bourne Area*. Private publication available from author.

Erratum: In the last Lincolnshire Naturalist, the photograph of *Ranunculus parviflorus* (plate 8) should have been attributed to Mark Tyszka rather than Rene Weston. The editor extends his apologies to him.

DRAGONFLIES & DAMSELFLIES - John Redshaw

The highlight of the year must surely have been the presence of red-veined darter *Sympetrum fonscolombii* at Gibraltar Point NNR, where an adult male and an old female were seen on Jackson's Marsh between 1st and 5th August. After an absence of many years, black darter *Sympetrum danae* returned to heathlands in the centre of the county, with records from Kirkby Moor and Moor Farm. Red-eyed damselfly *Erythromma najas* continues to thrive and expand its range, as does banded demoiselle *Calopteryx splendens,* with new records from Langtoft Gravel Pits and Grimsthorpe Park Lake.

We have been advised by Richard Chadd of the Environment Agency that the white-legged damselfly *Platycnemis pennipes* was seen on the River Chater near Wing in Rutland in 1998. This species is slowly spreading eastwards, its nearest previously known site being on the R. Nene near Thrapston in Northants. It may not be too long before this species finds its way into south-west Lincolnshire, either via the River Gwash or the Welland.

Many records received during 1998 filled useful gaps in the 10 km square distribution maps, and observations from new areas such as Orby/Bratoft, Revesby, the Kesteven fens, Bardney, and Grimsthorpe Park were welcome. David Bromwich has continued to input the past records onto the Recorder database and we are now checking the 1980's information for omissions. Although filling in the gaps in the distribution maps is a major objective in recording, equally important is the regular recording at well-watched sites such as Baston and Thurlby Fen Slipe, Kirkby on Bain Pits, Gibraltar Point, Messingham Sand Quarry and Saltfleetby -Theddlethorpe, as these annual records help to monitor the health of our dragonfly populations as well as building up long-term information on flight periods.

SHIELDBUGS - Annette Binding

The highlight of the year was the rediscovery of the green shieldbug *Palomena prasina* (plate 14) in Lincolnshire. I found a single nymph at Scotgrove Wood on the 6 August 1998 and an adult was found at the edge of the wood in the adjacent green lane on the 25 September by Allan Binding. The last known record for this species in the county was in 1928 in the Market Rasen area by Mr A Roebuck. The green shieldbug is well camouflaged, both as nymph and adult, and may well be overlooked as they move slowly and are difficult to spot amongst the green leaves on which they feed.

Legnotus limbosus were found in very good numbers in April in Washingborough by Allan and Annette E Binding. Mrs C Gallimore also found one specimen in June in Grantham. Only one specimen of the very pretty Blue Bug *Zicrona caerulea* was recorded, at the Twyford Forest LNU meeting on the 16 May by Allan Binding.

Although Allan and I did a great deal of recording work at Kirkby Moor Reserve in 1998 we were unable to find any more *Neottiglossa pusilla* or *Rhacognathus punctatus* which were found there by Roger Key in 1997.

Overall, there weren't many records in 1998 and numbers seemed to be down, although the hawthorn shield bug *Acanthosoma haemorrhoidale* was found in very large numbers of both nymphs and adult in late August at Ancaster Valley.

BUTTERFLIES - Allan Binding

Butterflies had a hard time in Lincolnshire in 1998 due to the cold and very wet weather. While walking along my local river bank in Washingborough, Annette and I saw hundreds of small tortoiseshell larvae on the nettles, very few of which were ever seen as adults as it rained for many days after our walk. Holly blue were an exception, however, many of which were seen throughout the county in spring and summer.

It was good to see so many grizzled and dingy skippers at the joint LNU/Butterfly Conservation meeting at Twyford Wood this year despite the poor spring. Marbled white and Duke of Burgundy fritillary were seen again in South Lincolnshire and clouded yellow and painted ladies were recorded but were not as common as recent other years. Some red admirals over-wintered in the county as records were received from early spring onwards.

Grizzled skipper at Twyford Forest photo Roger Key

Mr P C Hawker reported seeing a northern brown argus *Aricia artaxerxes* at Byard's Leap roadside verges on the 19 June, the last record we have of this butterfly in the county was in 1860. This may be a release by a unknown person!

A "new" county record was received from Wyn Jones of English Nature who photographed a tatty specimen of a central American heliconiine species *Dryas julia,* perched on a horseradish leaf in his garden in Crowland in September. This bright orange and black butterfly, somewhat resembling an elongate fritillary, is commonly bred in butterfly houses and might have escaped from the Long Sutton Butterfly House, about 25 km away.

MOTHS - Rex Johnson

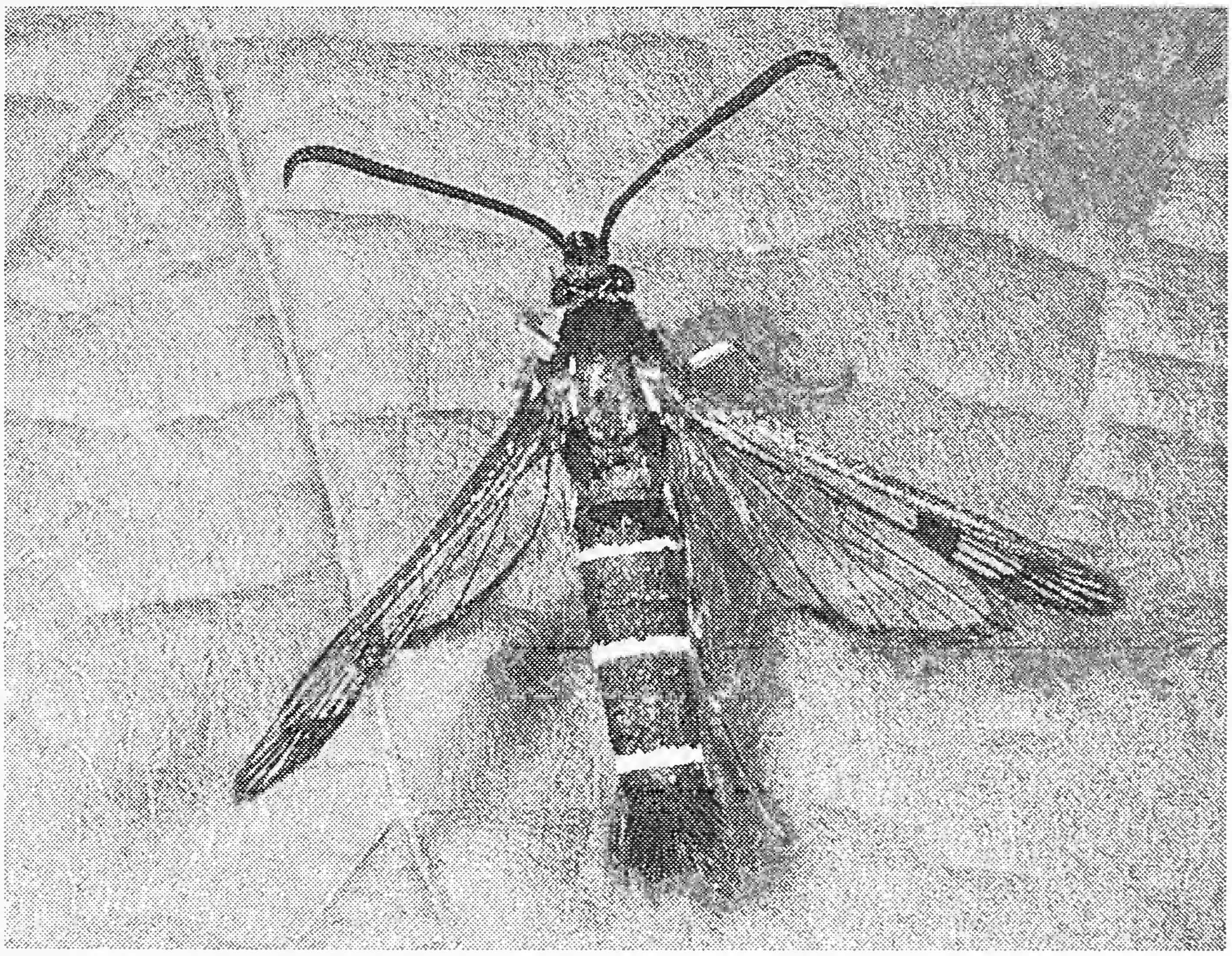
It seemed at the time that 1998 would be an extremely poor year for resident species. The weather made recording difficult during important flight periods and, when MV lights could be used, the number of moths attracted seemed low, down by a third or even a half of what might be expected. As records were sent in, however, it became clear that, while numbers of an individual species were well depressed (some represented by a singleton), the total number of species recorded held up reasonably well - a total of 438 macro moth species, which is reasonable, as the range in numbers since 1993 has been between 425 and 475.

Migrant Species. A good number of migrant species were recorded between May and October and it was an interesting year. A death's-head hawk-moth was found beside a beehive at Spalding by Mr & Mrs Morrish. This species appears every few years and was last recorded in 1994. We also had good numbers of some of the more regularly seen migrants including the vestal, humming-bird hawk-moth, convolvulus hawk-moth, dark sword-grass, pearly underwing, bordered straw and scarce bordered straw and hundreds of silver Y.

The most unexpected of the migrants was found by Colin Smith on 20th September who spotted an unusual looking pyralid species on the outside of his trap in Willingham Forest. It made a bid for freedom, but was pursued and captured and identified as *Diasemiopsis ramburialis.* This was last recorded in Lincolnshire in 1873. It was considered to be such a rare species that when it was sold in 1910 in a collection owned by Mr. J.A. Clark, the sale was reported in Entomologists' Record (Johnson, 1996).

Macro-moths. A few records were particularly notable. A goat moth pupal exuvium was found by Dr Martin Drake on 19th July. The pupa had emerged from a sappy hole on a young birch, and it was seen by Dr Dave Sheppard. This is a rare species in Lincolnshire, last seen in Sleaford in 1961 by GN Holland.

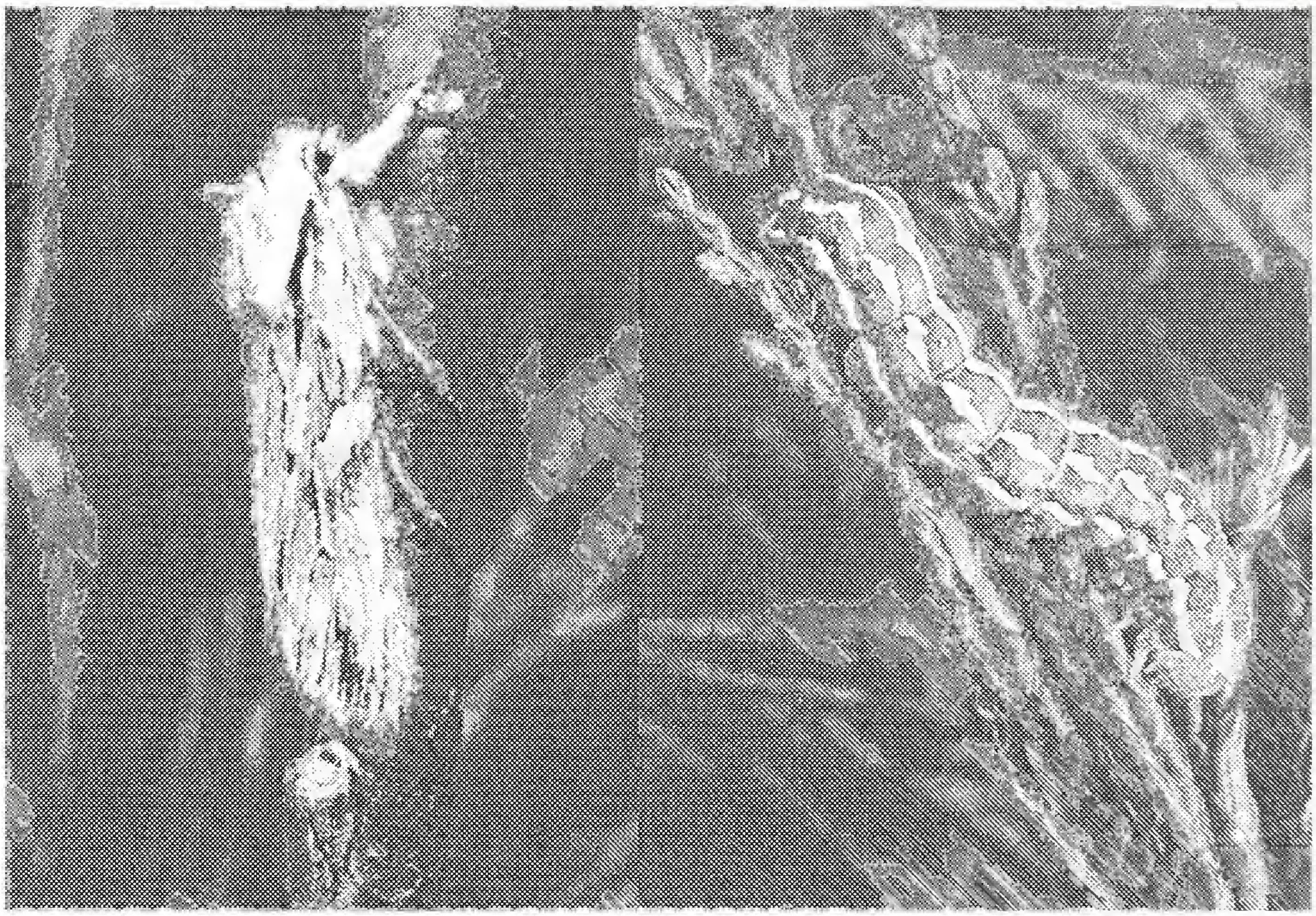
Records for clearwings have always been few and far between, but three species were seen in 1998. The currant clearwing was recorded by Dr Roger Key at Crowland, and by Adrian Gardiner at Bourne in July. In the same month Adrian saw the red-belted clearwing at Bourne. (Recorded there in the last few years for the first time since the early years of this century). In July I came across considerable evidence of the *large* red-belted clearwing (a Nationally Scarce B species). A good number of larvae were feeding in birch stumps in



Currant clearwing at Crowland photo Roger Key a clearing in Laughton Forest. It was possible to extract a larva for verification and to take photographs. The species was last recorded at Skellingthorpe (VC53) in 1916 by the Rev. Blathwayt.

Other good records were:
False mocha, Grimsthorpe Park, 13th July, R & WJ Johnson. (Infrequently seen in central woodlands, last seen by Rick Pilcher and Gerry Haggett around 30 years ago).
Light orange underwing, Wickenby Wood, 4th May, R & WJ Johnson.
Oak lutestring, Roughton, 9th September, Keith Robertson (not seen for many years).
Orange moth, North Hykeham, 7th July, Keith Bradshaw (few records).
Sloe pug, Barton on Humber, 15th June, John Kneeshaw.
Small brindled beauty, Linwood Warren, 27th March and Willingham Forest, 16th March, Colin Smith. (not seen since the 1960s, then by REM Pilcher).

Extension of range. A number of species have become more widespread across Lincolnshire since I became the LNU moth recorder in 1986. For instance, at one time if I wanted to find the pine hawk-moth I had to travel to Kirkby Moor, to the only reliable site. It is now widely recorded across the county. There are many more examples of species with a wider range in the 1990s, for example the golden plusia, now found across Lincolnshire with larvae regularly found eating delphiniums in our Messingham garden. Another species with progress plotted across the country is Blair's shoulder-knot. It first turned up in the Isle of Wight in 1951. The larvae feed on Lawson's cypress and the hybrid *leylandii* and garden hedging has provided a route via which it could eat its way across the British Isles. By 1961 it had spread along the south coast of England. By 1971 it was as far north as Essex, and by 1981 it was established from Cornwall up just south of the Wash. It was first recorded in Lincolnshire in 1990, since when there have been 86 records. It comes to light in moderate numbers between September and early November. The last record for it is for Barton on Humber, so the county is now fully colonised!



Blair's shoulder knot - a recent colonist on garden conifers photos J. Petyt

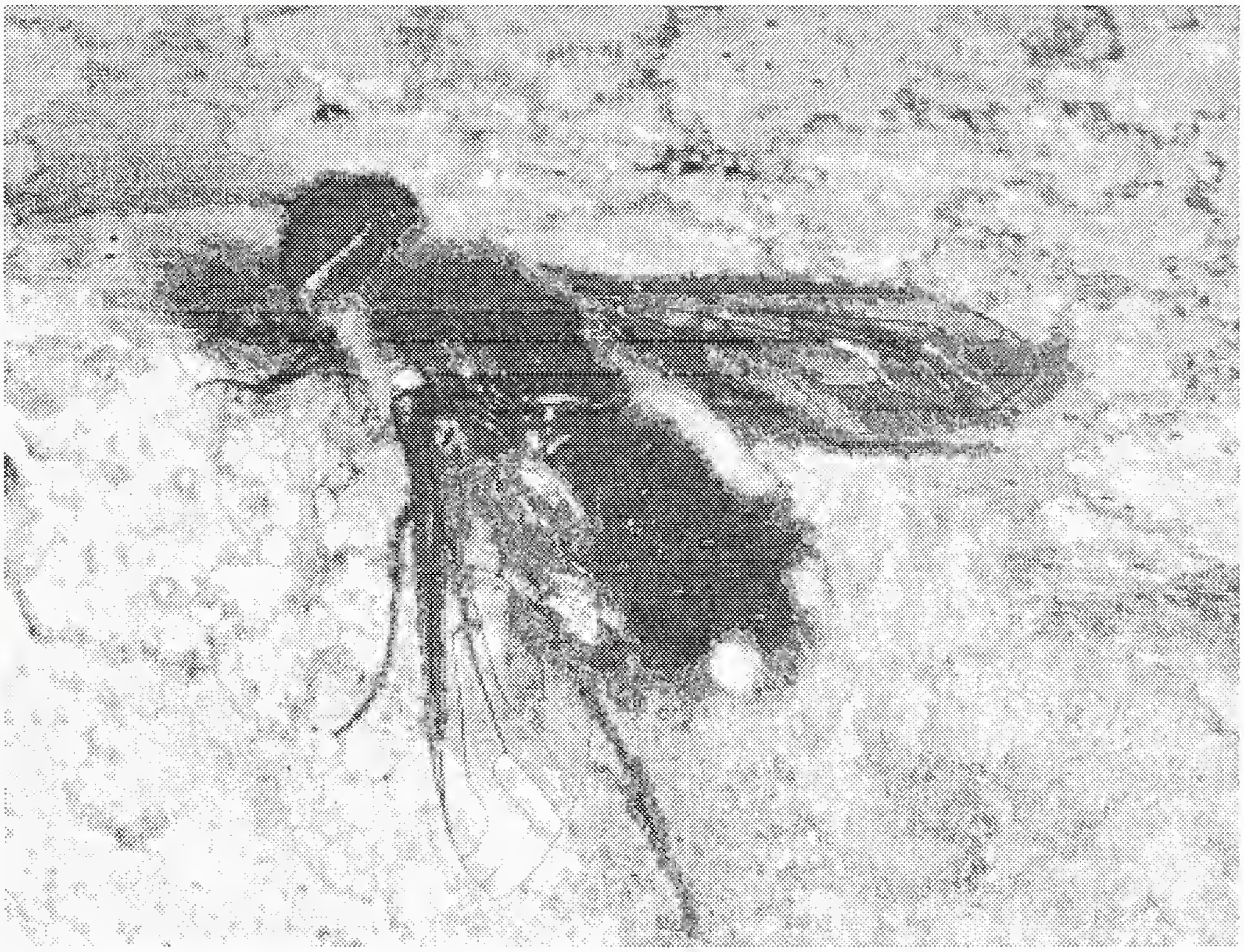
Micro-moths. Momentum with recording Lincolnshire's smaller moth species is continuing. In our original micro list (Mason, 1905-1918), about 500 species were listed. Since I became involved in updating the micro lists in the early 1990s, and have been joined by a small number of other enthusiastic recorders, around 334 additional species are now known to live in the county.

In 1998 there were 38 new vice-county and 5 new county records for micros. Space doesn't permit a full listing here, but anyone interested can contact me for a paper or computer list of all recorded species of micro-moth. An unusual record came from Andy Godfrey's study of the insect fauna in an oak rot-hole at Hagnaby (Godfrey & Mears, 1998) via Harry Beaumont who had undertaken identification of some of Andy's specimens by examination of their genitalia. In a water trap sample were remains of both sexes of quite a large number of *Triaxomasia caprimungella* a Nationally Scarce (B) tineid micro-moth new to the county. Maitland Emmet called this "a most remarkable record", with the only other recent sighting known to him being for Surrey, in 1986.

GODFREY, A, & MEARS, J. 1998. Natural History in Lincolnshire 1997. Flies. *The Lincolnshire Naturalist*. **24.** 189-190.
JOHNSON, R. 1996. *The Butterflies and Moths of Lincolnshire. The Micro-Moths and Species Review to 1996.* Lincolnshire Naturalists' Union. Lincoln.
MASON, J.E. 1905-1918, The Lepidoptera of Lincolnshire. Parts 1-6. *Trans. Lincolnshire Naturalists' Union*. **1**. 174-191, 230-262. **2** 75-103, 176-219, **3** 170. **4** 16-17.

FLIES - Andy Godfrey & Jillian Mears

Relatively few surveys were undertaken in 1998 and only a few flies was received for identification. A single male specimen of the bee fly *Villa modesta* was caught at Gibraltar



The bee-fly *Villa modesta* was recorded at Gibraltar Point photo Roger Key

Point in the West Dunes area on the 23 July by Annette Binding. This species is scarce in northern England and has a mainly coastal distribution. Also taken on the same day were four species of black and white soldier flies identified as: *Nemotelus nigrinus* a local species of marshy places, *N. notatus* a local species in saltmarshes, *N. uliginosus,* local in reed beds and *Nemotelus pantherinus,* local in fens and calcareous flushes. John Lamin also found the soldier fly *Oxycera rara,* a local species in flushes, at Carrdyke Farmhouse North at Rippingale.

A survey of land at Burton on the outskirts of Lincoln by Andy Godfrey produced the local scathophagid *Cleigastra apicalis* which is phytophagous on marginal plants.

Material collected by Annette Binding included the Nationally Scarce drosophilid *Stegana coleoptrata*. This is unusual in that it holds its wings in an arched fashion over it's back. The larvae feed under bark. Also of interest were *Egle minuta* and *E. muscaria*, two anthomyiid flies that occur in early spring on sallow blossom. Because they only appear for a brief period in late March and April and are only at blossom they are infrequently taken although a number of uncommon hoverflies may also be found this way.

AG's study on the large rothole at Hagnaby continued till June. There were several additions to the rothole fauna including the snipe fly *Ptiolina*, both species of which are Nationally Scarce. Unfortunately, the voucher could not be traced in time for this report and therefore the species determination will have to wait. The total Diptera fauna for the rothole now includes over 100 species with three Red Data Book 2, three Red Data Book 3 and nine Nationally Scarce species.

BEETLES - Roger Key

As usual, there are a few significant pre-1998 records that have come to light in the year and are worthy of mention before relating the finds of 1998. First, two published species have been 'struck off' the Lincolnshire list as a result of examination of the Wallace collection in the Rumbold Street museum warehouse in Lincoln (Key, 1999). These are *Metabletus obscuroguttatus*, from Heighington in 1912 (incorrect identification of *Badister sodalis*) and *Agonum piceum* from Little Coates in 1912 (incorrect *A. fuliginosum).*

Dr Colin Welch, recently retired from the Biological Records Centre at Monks Wood, presented me with a pleasant surprise during the year, an extensive manuscript of beetle records from the Lincolnshire Limewoods from a survey undertaken between 1969-1971. This included 2000+ records of which I was unaware and added 10 species to the county list: *Colon latum* (NB), *Colon appendiculatum* (pRDBK), *Stenus fuscicornis* (NB), *Gabrius subnigritulus*, *Atheta brunneipennis*, *Silusa rubiginosa*, (NB), *Aleochara diversa* (NB), *Meligethes kunzei*, *Meligethes ochropus* (NB), *Meligethes lugubris* (NB). There were also two records of the small rove beetle *Ilyobates nigricollis* (pRDBK) from Stainfield Woods and Hardy Gang Wood, a species not seen in the county since Fowler found it at "Lincoln" in the nineteenth century.

Alex Williams from Kent identified a number of difficult rove beetles which I have amassed over the years. These included *Atheta benickiella* (NB), which Andy Godfrey had found at Hackthorne Beck in 1996, which is new to the county, and *Aleochara grisea,* which Annette Binding had found under seaweed at Gibraltar Point in 1997. Otherwise this species has been recorded at Horseshoe Point in 1979 and at Grimsby in 1907. Mike Denton of Huddersfield sent me some records of small rove beetles that Alan Lazenby had sent him from Blankney Fen in 1986. They included *Oxypoda longipes* which is new to Lincs.

At a couple of events at Gibralter Point, members of the LNU have been sorting insect trap samples collected by Dave Sheppard and Graham Weaver in the Limewoods in 1991/92 and by Joanna Francis from a number of woods throughout the county in 1995. Both have produced far too many interesting records to list, but species previously unknown in the county are the "tumbling flower beetles" *Mordellistena neuwaldeggiana* (pRDBK) in large numbers from Wickenby Wood and Newball Wood in 1991 and *Mordellistena variegata* from Newball Wood in 1991 and the rove beetle *Tachinus proximus* from Danby's Place in July 1995. The ground beetle *Notiophilus quadripunctatus* (NB) from Hatton Wood in 1992 was only the 2nd county record, the other being at Laughton in 1979.

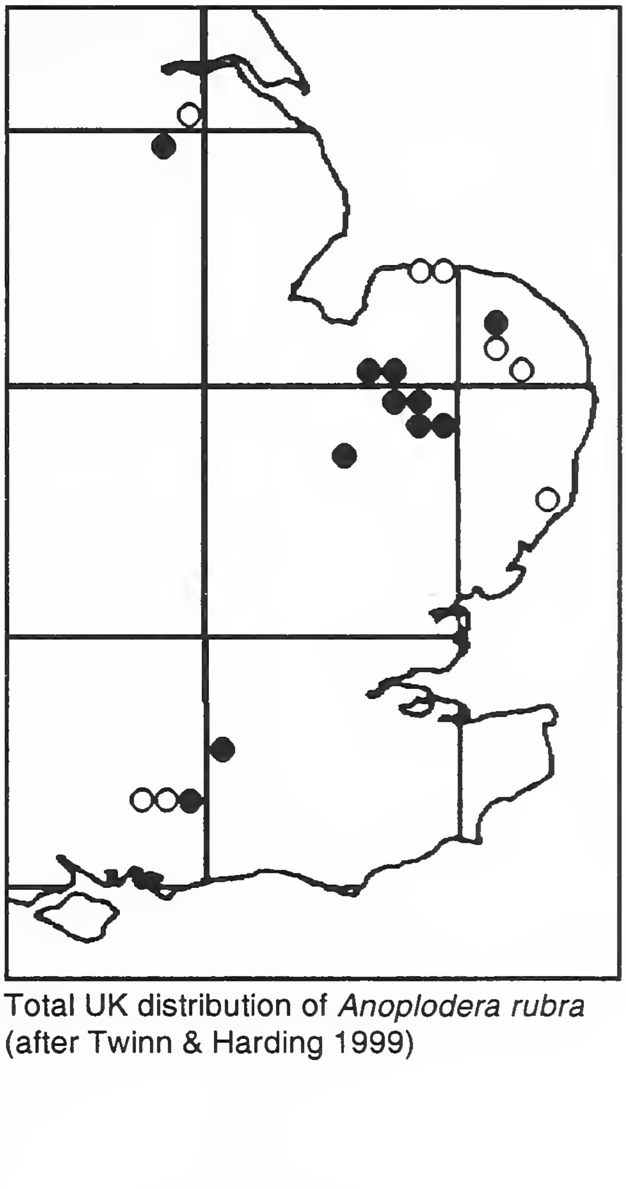
1998 itself produced nine species new to the county, not as large a number as recent years, but not bad considering the very poor weather, which deterred recording effort, whether or not it impacted on the beetle fauna itself.

A new species of water beetle turned up to Richard Chadd of the Environment Agency at Whisby Pits Nature Park on 20th March. *Coelambus nigrolineatus*, a black and yellow striped species, is a recent colonist in this country and known to be spreading in mainland Europe (Carr, 1984). Its spread is being documented, and, although it is currently classified as Nationally Scarce (A), it no longer warrants this status. Richard also found *Cercyon ustulatus* (NB) at South Drove Drain on 30th April.

Bob Marsh, from the Yorkshire Naturalists' Union, was given a series of pitfall trapped specimens from Crowle Moors by a student from Hull University. Among them was one of the sexton beetle *Nicrophorus interruptus* (NB), often mistakenly recorded in error for one of the commoner species, but which has not been confirmed from the county before.

An interesting experiment in my garden at Crowland turned up a flea beetle with only a single other county record. I grow a number of native foodplants of British beetles in my garden in the hope that plant-feeding species may turn up and have had a clump of deadly nightshade *Atropa belladonna* in my garden for over ten years. This year it suddenly supported the tiny flea beetle *Epitrix atropae* (NB), with every leaf punctured with tiny holes and hundreds of beetles present. The only other Lincolnshire record is from Scottlethorpe Quarry, found by Annette Binding in 1995. The nearest deadly nightshade plants that I know of (which also support this species) are 20km away in Northamptonshire. The second species of this genus, *Epitrix pubescens* turned up new to the county on the LNU meeting at Rose's Plantation, Laughton on 16th August, on its foodplant woody nightshade *Solanum dulcamara*.

That meeting produced a number of other interesting species. The large longhorn beetle *Anoplodera rubra* turned up in numbers both at Rose's Plantation and in the heathland restoration plot in the main block of Laughton Forest. This is a restricted species nationally, almost restricted to the Norfolk/Suffolk Breckland


Total UK distribution of *Anoplodera rubra* (after Twinn & Harding 1999)

but possibly expanding its range (Colston & Key, 1999). It feeds on decaying pine stumps and is thus able to thrive in the restoration area where the conifers have been felled. It has only once ever been found in Lincolnshire before, at Ashbyville in 1948 by Peter Gooseman. Two other scarce species of darkling beetle associated with decaying wood were also found, *Eledona agricola* (NB) in bracket fungi at Rose's Plantation, and the rare *Corticeus unicolor* (RDB3) near Hardwick Hill by Colin Faulkner, also in bracket fungus. This species has a peculiar distribution in the UK, now being now restricted to a fairly small area centred on Sherwood Forest, although it was formerly more widespread. It is only the second Lincolnshire record, the first being at Skippingdales Plantation in 1992.

Colin also found another species in fungus, the rove beetle *Sepedophilus lusitanicus* at Linwood Warren on 13th September. This species is new to the county, although is a relatively "new" species, resulting from a taxonomic split (Hammond, 1972). Another member of the genus with only two other county records, *Sepedophilus constans* (NB), was found at Goslings Corner Wood on 15th March by Annette Binding. Annette Faulkner found the rove beetle *Philonthus rectangulus*, new to the county, at Vernatt's Nature Reserve on 19th February.

Another beetle with a distribution somewhat similar to that of *C. unicolor*, although slightly more widespread, is the bright red and black net-winged beetle *Pyropterus nigroruber* (NA). This species is well known from the county, especially the Limewoods, but Alan and Annette Binding found two new sites for it this year, Kirkby Moor on 21st July and Linwood Warren on 5th July. Significantly, the species was found egg laying in decaying conifer timber, a fact noted as probable, though not confirmed, by Hyman & Parsons (1992).

A particularly rich fauna of species usually associated with bare wet sand and gravel beside rivers turned up at Stanton's Pit Trust reserve on 16th May, returning from the Twyford Wood LNU meeting. This included 21 species of ground beetle and 13 species of rove beetle typical of this habitat. Most interesting was the small bronze ground beetle *Bembidion punctulatum*, the first time this species has been found in Lincolnshire since 1895, where it was found among a very rich assemblage of such species that formerly occurred on the Trent banks at Newton-on-Trent (Thornley, 1895). Although common in northern and western Britain, this is the species' easternmost record (Luff, 1998). A number of other nationally scarce species were also found, including the tiny water beetles *Hydroglyphus pusillus* and *Chaetarthria seminulum*, the flea beetle *Longitarsus dorsalis*, which feeds on ragwort in dry places, usually on limestone, and the weevil *Phytobius canaliculatus* which feeds on water milfoil (all NB). A report on the beetle fauna of this site has ben prepared for the Trust and it is hoped that the management of the site can be adjusted to favour this fauna which seems to be unique in the county.

As usual, Annette Binding found a number of species of note during the year, including a small reddish beetle *Leiodes rufipennis*, which has not been recorded here before. Members of this genus are usually said to occur on the underground parts of fungi, including truffles. This turned up at Sotby Wood on 4th May. Members of the genus *Leiodes* have been virtually unidentifiable until the recent publication of a good key. Annette found a related species *Choleva jeanneli* at Copper Hill on 16th May and I found the same species at Friskney Decoy on the 26th April. There are only two other county records. Annette also found the weevil *Strophosoma capitatum*, also new to the county and which feeds on various trees and shrubs, at Linwood Warren on 13th September.

Other notable species that Annette found in 1998 include the rove beetle *Oxytelus sculptus* at Washingborough on 20th July, a supposedly common species, but which has been found in the county only twice before, in 1908 and 1977, the small black *Telmatophilus* *schoenherri* (pRDBK), associated with reedmace, with 3 other county records, which she found at Burton Gravel Pits on 3rd May, the tiny *Enicmus testaceus* at Kirkby Moor on 1st June (all but one other records are from Grimsthorpe Park), and the "false darkling beetle" *Conopalpus testaceus* (NB) from Moor Farm on 29th June. This species is almost certainly spreading in the county, being found new in 1995 and now known from 6 sites.

John Lamin has found a number of species of interest in the county in the year. The 'withy weevil' *Cryptorhynchus lapathi* has been scarce in the county for many years, with only a couple of recent records, all others being from the 19th century. John found the species in willow at Bourne South Fen on 6th February and again on 6th July. He also found the second Lincolnshire specimen of the brick-red rove beetle *Deleaster dichrous* (NB) at light at Temple Wood on 5th August. This species is more commonly found on sand or shingle beside rivers, although its only other county record is from a pitfall trap on Crowle Moors in 1990. An additional significant find was of the bright red and black "cardinal" click beetle *Ampedus quercicola* (NB) at Lawn Wood on 14th June. This species is otherwise only known from Grimsthorpe Park in Lincolnshire, and is at its northern limit in Britain here. Its presence at Lawn Wood helps confirm this site as one our foremost dead wood sites.

The withy weevil *Cryptorhynchus lapathi* from Bourne South Fen photo Roger Key

Another quite rich dead wood fauna turned up when I visited Castledyke Wood on 27th September. It included four nationally scarce species, two small histerid beetles *Abraeus granulum* (NA), otherwise only known from Andy Godfrey's tree rothole at Hagnaby, and *Plegaderus dissectus* (NB), the very tiny featherwing beetle 1.2mm long *Ptenidium gressneri* (NB), which is new to the county, and the rove beetle *Dropephylla gracilicornis* (NB), with only two other county records, as well as another 17 quite local dead wood species. The quality of habitat at this site, with large quantities of fallen decaying wood, and very large trees with large rot-holes etc, indicates that this site will prove very valuable for this fauna.

Andy Godfrey's study of an oak rot-hole at Hagnaby produced another new species, the small bark-dwelling weevil *Acalles roboris* (NB), and two species with few Lincolnshire records. On 6th May and 5th June specimens of the minute (and hence probably overlooked) *Euplectus signatus*, turned up, otherwise only known from Great West Wood in 1971 and *Dendrophilus punctatus*, a small beetle last seen in the county in 1899.

Peter Wilson sent me a couple of excellent slides which enabled me to identify the species portrayed. One was of a large and very handsome rove beetle, *Platydracus latebricola* (NB) which is black with red wing cases, photographed at Ostler's Plantation. We have only four other records of this conspicuous species. Alan Lazenby found a number of species of note in the year, including rove beetles *Philonthus debilis* from Blankney Fen on 4th March, only the 4th county record and the first since 1909 and *Leptacinus batychrus* in a rotting grain dump at Blankney Fen, known only from a single specimen from Bollingbroke in 1941 (Graham, 1941). In the same dump he also found the "red legged copra beetle" *Necrobia rufipes*, a metallic blue species, sometimes a minor pest of stored products, but only the 5th Lincs record and the first since 1954.

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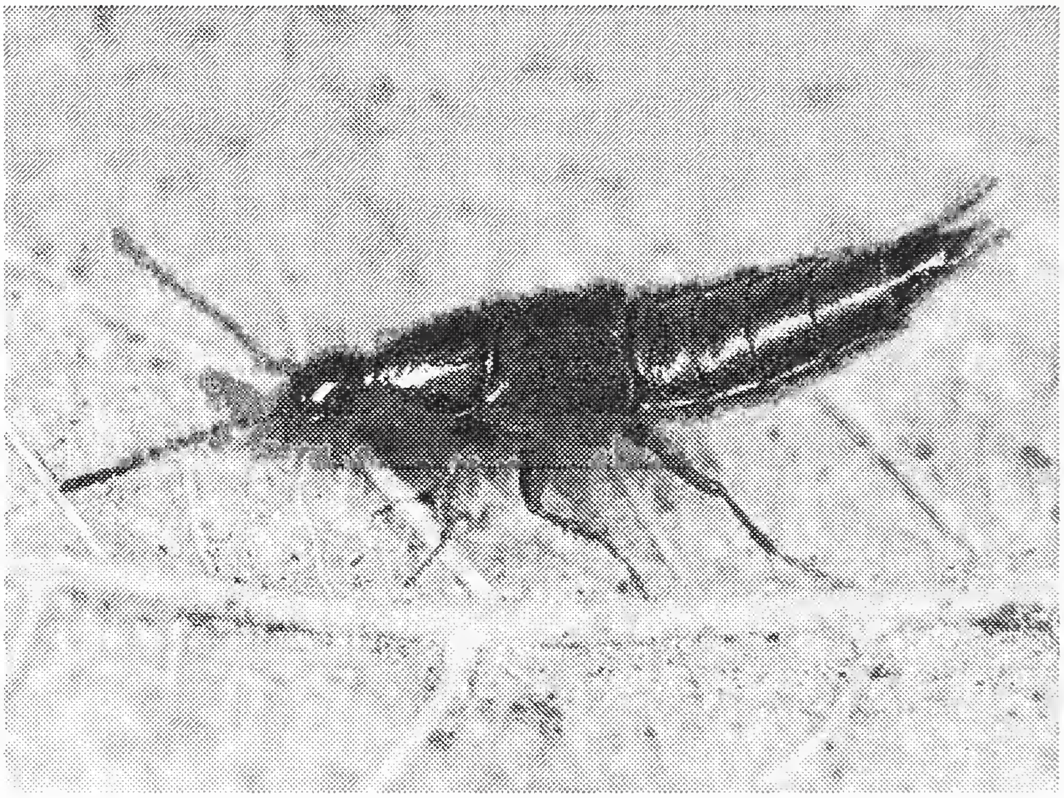
An attractive scarce fenland species of ground beetle *Badister unipustulatus* (NB) (illustrated in my report for 1995, with earlier records) turned up to me in an unremarkable ditch at Deeping St James on 26th September. I suspect that it might be quite widespread if the vast network of ditches in the fens were examined for ground beetles.

Finally, on New Year's Eve I found an excellent fauna of wetland beetles concentrated by floods in exposed tussocks, reed litter and moss covered logs at the Trust reserve at Surfleet Lows. These included two very scarce ground beetles: *Agonum livens* (NB), *Badister dilatatus* (NB), and water beetles *Cercyon sternalis* (NB), of which there is only one other Lincolnshire record, from Baston Fen in 1995 by John Bratton, and *Cercyon tristis* (NB) of which there are only 2 other recent county records. The list from Surfleet also included *Philonthus fumarius*, a wetland rove beetle which is new to the county. On the same day I found the ground beetle *Demetrias imperialis* (NB) at Crowland Ponds, with only two other records.



The rove beetle *Philonthus fumarius*, new to the county on New Year's Eve

photo Roger Key

References

CARR, R. 1984. A *Coelambus* species new to Britain (Coleoptera: Dytiscidae). *Entomologists' Gazette*. **35**. 181-184.

COLSTON, A. & KEY, R.S. 1999. *Anoplodera rubra* (Linnaeus) (Cerambycidae) new to Cambridgeshire and rediscovered in Lincolnshire. *Coleopterist.* **8**. 40-41.
GRAHAM, M.W.R.d.V. 1941 Hymenoptera, Hemiptera, Neuroptera, Trichoptera, etc., in East Lincolnshire. *Entomologist's Monthly Magazine* **77**. 97-101.
HAMMOND, P.M. 1972. Notes on the British Staphylinidae 3. The British species of *Sepedophilus* Gistel (*Conosomus* Auctt).*Entomologist's Monthly Magazine.* **108.** 130-165.
HYMAN, P.S. & PARSONS, M.S. 1992 & 1994. A Review of the Scarce and Threatened Coleoptera of Great Britain. Parts 1 & 2. *UK Nature Conservation.* **3** & **12**
KEY, R.S. 1999. Access to the Lincoln City Museum Collections. LNU Communiqué.
THORNLEY, A. 1895. On some Trent *Bembidia* &c. *Entomologist's mon. Mag.* **31**. p240.
TWINN, P.F.G. & HARDING, P.T. 1999. *Provisional atlas of the longhorn beetles (Coleoptera, Cerambycidae) of Britain.* Biological Records Centre. Monks Wood.

SAWFLIES - David Sheppard

Sawflies are not a popular group amongst entomologists, partly because most of the identification guides are out of print. Nevertheless, with only 500 species in Britain, they are a manageable group and there has been some interest from Lincolnshire entomologists in the past. The earliest major list which I have found, so far, is by Alfred Thornley (1899) who recorded 50 species from Lincolnshire. Dennison Roebuck (1937) listed 83 species and Marcus Graham from Old Bollingbroke added many more during his early collecting days, before becoming a professor of entomology at Oxford University (eg Graham, 1941). The current list for Lincolnshire stands at 173 species, with a number of widespread species still awaiting discovery in the county. Two species of particular note were recorded in 1998.

One day the phone rang and a certain lady from Spalding asked if I would be interested in identifying a large wood-wasp which had fallen into a pot of paint. Not being put off by a mere layer of paint obscuring all visible identifying features of this animal and doubtless gumming together wings, legs, antennae and mouthparts into a twisted mess of appendages, I agreed to examine the specimen. In fact, the specimen was still in good condition and the bright red paint was confined to the tips of the wings and odd splashes contrasting nicely with the dark metallic blue of the legs and abdomen. It was quite the prettiest specimen of *Sirex juvencus* I had seen - and the first for Lincolnshire since 1899.

The second specimen of note was described to me over the phone by this same lady from Spalding. The luckless insect had been found on a window in a house there. It was described as a giant dark brown and yellow wasp-like creature with four dark brown wings, but it was definitely not a hornet. The beast had me totally baffled, so this I had to see. As soon as I saw it I knew what it was but could not believe it. It was a thoroughly swatted specimen of *Cimbex connatus*. Although associated with alder, this has always been a rare species and was considered to be extinct in the UK until a specimen was taken in Wiltshire in 1997. Now it has appeared for the first time in Lincolnshire. Not a bad start to recording the sawflies of Lincolnshire!

GRAHAM, M.W.R.d.V. 1941 Hymenoptera, Hemiptera, Neuroptera, Trichoptera, etc., in East Lincolnshire. *Entomologist's Monthly Magazine.* **77**. 97-101.
ROEBUCK, W.D. 1937. Sawflies of Lincolnshire. *Trans. Lincs. Nat. Union.* **9**.153-157.
THORNLEY, A. 1899. The Hymenoptera Sessiliventres of the counties of Nottinghamshire and Lincolnshire : A preliminary List. *Naturalist.* **1899**,165-170.

WASPS, ANTS AND BEES - Michael Archer

Four new species have been added during 1998 (although only one was actually recorded in 1998) to the list of aculeate Hymenoptera for Lincolnshire, which now totals 277 species.

The new species are: *Methocha ichneumonoides* Latreille, an ant-like species that parasitises tiger beetle larvae in their burrows, previously missed from my 1996 report (Archer, 1997), at Woodhall Spa (Graham, 1941), *Tiphia minuta* Vander Linden, probably a parasite of chafer larvae underground, at Rauceby Warren, 23rd June 1997, A.S. Lazenby; *Crossocerus binotatus* Lepeletier & Brullé, a black & yellow species that nests in rotten wood and stocks its nest with flies, in a rot hole at Hagnaby, Aug 1996, A. Godfrey; and *Lasioglossum parvulum* (Schenck), a small mining bee, at Blankney Fen, 9 May 1998, A.S.Lazenby.

Methocha ichneumonoides a tiger beetle parasite photo Roger Key

Other important records during 1998 were *Podalonia affinis* (Kirby) (RBD3, 5th record), a red and black sand wasp that stocks its nest with caterpillars, and *Sphecodes crassus* Thomson (7th record), a red and black species cleptoparasitic on mining bees of the genus *Lasioglossum*, both from Saltfleetby-Theddlethorpe NNR on 25th June by M.E.Archer.

References

ARCHER, M.E. 1997. Lincolnshire Natural History in 1996. Aculeate Hymenoptera (Bees, Wasps & Ants). *The Lincolnshire Naturalist.* **24**, 126-128.

GRAHAM, M.W. 1941. Hymenoptera, Hemiptera, Neuroptera, Trichoptera, etc., in East Lincolnshire. *Entomologist's Monthly Magazine.* **77**, 97-101.

SPIDERS - Annette Binding

Although not yet expert with spiders I have in the last few years become interested in several of what might be described as the 'prettier' species and the more distinctive families. The families that particularly interest me are the jumping spiders *Salticidae,* the crab spiders *Thomisidae* and orb-web spiders *Araneidae.*

The salticids are characterised by having two enormous eyes like a pair of head-lights at the front of the head and with their six other eyes this gives them extremely good eyesight, essential for hunting prey but it also makes them very difficult to catch as they tend to see you first! However I did manage to catch and identify a number of species from this family in 1998. The most common is the distinctive black and white striped, and aptly named zebra spider *Salticus scenicus* which I have found in a great many locations in the county including my own garden in Washingborough. A similar species, *Salticus cingulatus*, but one which has much more hair cover on the carapace, turned up at Gibraltar Point NNR and Burton Pits. A single male *Euophrys frontalis* was found at Copper Hill PRV on 16th May and two males and several females of the same species were recorded at Twyford Forest LNU meeting on the same day. The male *Euophrys frontalis* has distinctive white-haired palps. The fairly large species *Evarcha falcata* was very numerous at Kirkby Moor and was also found at Moor Farm.

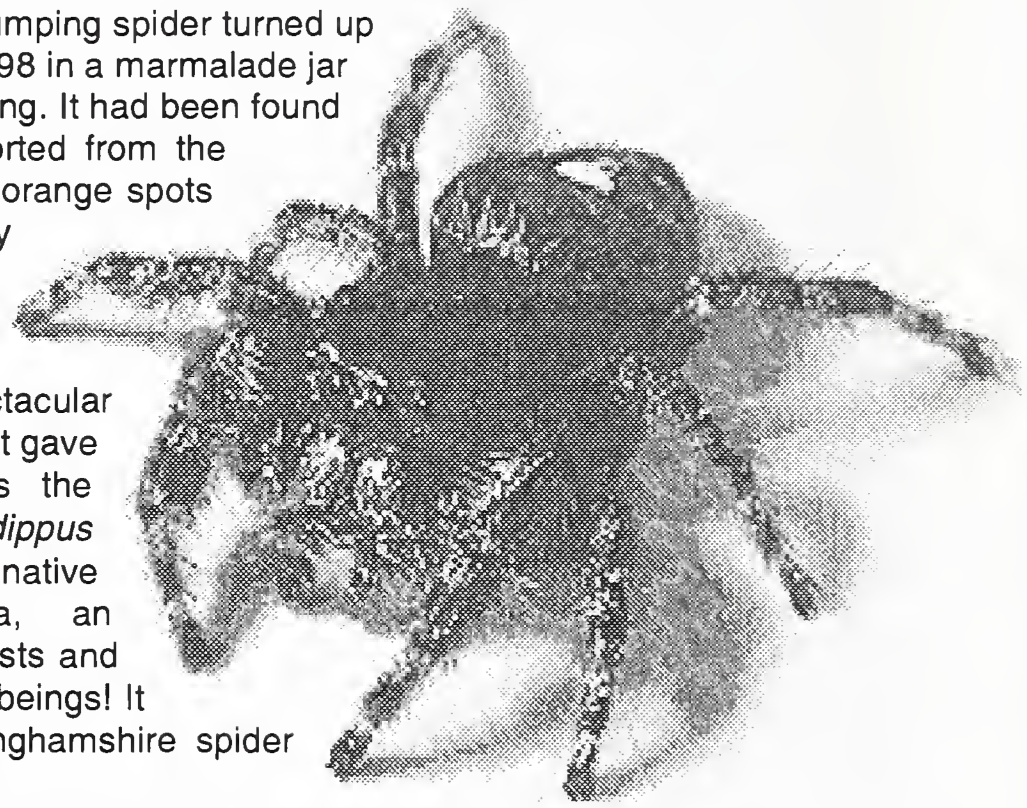
Evarcha falcata a typical jumping spider, illustrating the two prominant front eyes photo Roger Key

A number of araneids were recorded in the county in 1998, including *Larinioides cornutus* in the damper areas at the Twyford Forest meeting in May. It is common in wet areas and often makes its webs in reeds. I also found *Atea sturmi*, a species which prefers evergreen trees and shrubs and, although widespread in Great Britain, is uncommon throughout. Evergreens are also the preferred habitat of two rather strangely shaped species, *Cyclosa conica* and *Gibbaranea gibbosa. C. conica* is a local species and was found in March at College Wood. Its abdomen is elongated at the back into a tubercle, more noticeable in the female than the male, giving it a 'teardrop' appearance when viewed from above. *Gibbaranea gibbosa* has two very prominent humps on its abdomen and the colour is dark brown with green markings and sides. It is common in southern England but not so common in the north. A single specimen was found at Copper Hill PRV on the 16th May.

Amongst other groups, I found *Steatoda phalerata (Theridiidae)*, a black species with yellow marks on the abdomen typical of sandy soil and it was found in large numbers on the open heathland areas at Kirkby Moor in late May and June. where I found good numbers of another sand-loving species *Arctosa perita*. This fairly large species of wolf spider *Lycosidae* has clearly banded legs. *Agelena labyrinthica* was also widespread on both Kirkby Moor and Moor Farm Reserves. It makes a very large web in low-growing vegetation with a tubular retreat into which it vanishes when it senses movement. Also on both reserves, was the uncommon woodland species, *Achaearanea lunata*, known from only seven other county records. The webs are made up to 6 ft off the ground often strung between nearby tree trunks, as was the one at Moor Farm Reserve. The spider makes a retreat from dead leaves and bits of bark on one side of the web. The adult spider is usually beautifully patterned in varying shades of ochre-yellow and red with black and white stripes and spots.

Both the "harvestman spider" *Pholcus phalangioides* and "spitting spider" *Scytodes thoracica* were recorded in Washingborough in 1998. *P. phalangioides* turned up at a second site in the village indicating that it is probably more widespread in the area.

Finally, one very unexpected jumping spider turned up at my house on 13th March 1998 in a marmalade jar brought to me by Sarah Fleming. It had been found lodged in a motor bike imported from the USA. It was dark brown with orange spots on the abdomen, the usual very large eyes, metallic emerald green chelicerae and with two large tufts of hair on top of its cephalothorax - a spectacular beast. Research on the Internet gave a probable identification as the "golden jumping spider" *Phidippus audax* a very common native throughout North America, an important predator of crop pests and an occasional biter of human beings! It was passed on to the Nottinghamshire spider recorder Mr Tom Faulds who kept it alive for several months.



Phidippus audax - imported jumping spider from north America

photo ex University of Arizona

I am grateful to the Tom Faulds and Trevor Harris of Nottinghamshire for their encouragement in the study of spiders and for checking several of my identifications.

NON-MARINE MOLLUSCS - John Redshaw

Chris du Feu reports that the Spanish slug *Limax valentianus* continues to thrive on waste land at Gainsborough. Recording of slugs by the Queen Elizabeth High School's "Slug Safari" continues in the Gainsborough area and an extensive list of records has been provided, including some new 10 km records. The most important discovery by the "Slug Safari" in 1998 was of the shelled slug *Testacella haliotidea,* which was found in the garden of Highfield House at Gainsborough on 5th May. There are three British species of shelled slug, but only this one is known from Lincolnshire. Of particular interest is the fact that there is only one previous record - and that was from the same garden - where it was found by F.M.Burton on 22nd April, 1898, exactly one hundred years ago.

MAMMALS, REPTILES & AMPHIBIANS - Norah Goom

The year has produced a greater number of records for a good number of species. However the records received are still mainly of random sightings or evidence on the ground and cannot yet be taken as indicative of current distribution or sizes of populations: rather they indicate the distribution and peregrinations of observers. The exception to this is the brown rat *Rattus norvegicus,* which was very rarely reported in the previous decade but clearly "took off" in 1998. Water vole *Arvicola terrestris*, on the other hand, an endangered species and under threat in one site from housing development, provided over 20 records, but this is unlikely to be the result of an increased population. Awareness of any species is stimulated when it is known to be on the danger list.

Mice and voles are still under-recorded. With house mouse *Mus musculus* hardly figuring at all in the reports it may be that householders are reluctant to report trapping and even more reluctant to look at corpses for signs of yellow-necked mouse *Apodemus flavicollis.*

There has been a number of fox *Vulpes vulpes* and badger *Meles meles* dead on the roads. There was one possible but, of necessity, confidential report of otter *Lutra lutra* and some dubious ones which might be mink *Mustela vison,* as they were from locations where mink were known to have been. Records of deer have been about average except for muntjac *Muntiacus reevesi* which were believed to be causing problems in two locations.

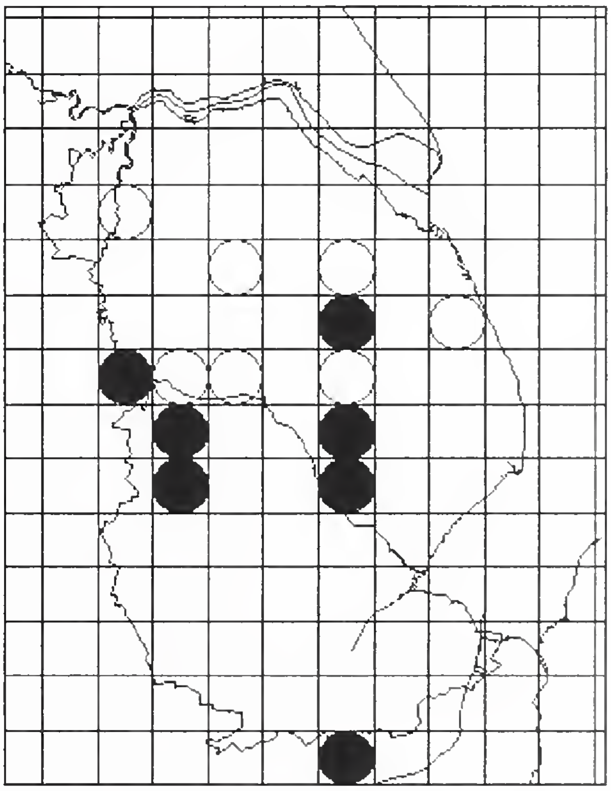
Marine mammals were in the news when a sick young bearded seal *Erignathus barbatus* was taken in to Mablethorpe Animal Gardens and Seal Trust. It was nursed back to health and subsequently flown to Shetland to be returned to the wild. A harbour porpoise *Phocoena phocoena* in January and a Sowerby's beaked whale *Mesoplodon bidens* in May were both reported dead at Mablethorpe and collected by the Natural History Museum.

The reptiles may have had mixed fortunes. While grass snake *Natrix natrix* was deemed to have had a good year in two Trust reserves and eggs were found close in to Lincoln, only 3 slow-worms *Anguis fragilis* made it to the records. Common lizard *Lacerta vivipara* produced an unexpected total of 17 reports. Similarly, amongst the amphibians common frog *Rana temporaria* and common toad *Bufo bufo* rated a fair number of records but all the newts came at the bottom of the table.

BATS - Annette Faulkner

There were still a few more records to come at the time of writing, but generally speaking 1998 was another rather poor year for nursery roosts. However, there were far fewer abandoned babies than in 1997 as the weather in the second half of June and early July, when most of the babies are born, was better, but a number of colonies failed to return to their established roosts for reasons we can only guess at.

1998 has to be the year of the Natterer's bat *Myotis nattereri.* In May, a grounded first year female was brought to us from New York and has had to go into permanent care as a "publicity" bat because she can barely fly. We also received a record of a Natterer's summer roost at Woodhall



Natterer's bat - pre and post 1990 records

Spa which is only the second in the county, although they are regularly found at the hibernation sites north of Lincoln. Three abandoned babies were found at Navenby: two were already dead and the third died in care. The roost may have been in an old barn, but Natterer's have been found to change roosts frequently. Finally, an injured Natterer's was found at Welbourn that also died in care. The last two records add to a chain of Natterer's records from villages along the Lincoln Heath, extending from Waddington down to Welbourn, with a possible site at Fulbeck, all recorded since 1992.

We have had the usual run of grounded, injured and orphaned bats, some of which we were able release. A highlight was a Brandt's bat *Myotis brandti* from Great Limber, only the second county record, which was reared from a three day old baby by colleagues in Lincoln. Sadly, it died suddenly at four months old. The first confirmed Lincolnshire Brandt's record was from the 1980s by two Cambridgeshire bat workers, which they found in one of the hibernation sites regularly monitored, although, unfortunately, the exact details remain obscure.

When I took on the job of sorting out the bat records in 1996 it fairly soon became apparent that we had large numbers of roost records for which there had been no follow-up. Were the bats still using the roost? Had the numbers using the roost declined, stayed the same or increased? In early 1998 we obtained funding from English Nature to send out a questionnaire to all roost holders between 1982 and 1992. In all, we sent out 237 questionnaires of which 104 were returned, plus a few telephone enquiries, and visits (c.42%). Of these, 39 still had their bats, 40 had lost their roosts, and the remainder were "Don't know"s (19). Of the "yes" group, only two showed an apparent increase, but 12 people in this group have signed up to take part in the National Bat Colony Survey, which will provide a much better indication of numbers.

Of the "Nos", many of the roosts disappeared in the eighties but, of those still present in the nineties, there seems to have been a steady decline in numbers each year, though at least one, a brown long-eared *Plecotus auritus* roost, was lost to unauthorised building work, the result of total ignorance by all parties involved, even though the owners were "pro-bat". There is still a lot of work needed on analysis of the "No" responses, but the second half of the questionnaire, on attitude towards bats, is more encouraging. Of those who still have/had bats in their property into the nineties, all are tolerant, many enthusiastic and no-one disliked their being there. On the other hand, of course, we don't know about the other 58% who didn't return their questionnaires......... In 1999 questionnaires will be sent to owners of roost reported in 1993.

TRANSACTIONS OF THE LINCOLNSHIRE NATURALISTS' UNION

Officers of the Union in 1998

President	Dr Ted Smith	**President Elect**	Mr Graeme Clayton
General Secretary	Mr Dave Bromwich	**Treasurer**	Mrs Mark Crick
Auditor	Mr John Levine	**Membership Secretary**	Mr Allan Binding
Publicity Secretary	vacant	**Programme Secretary**	Mr Neil Pike
Sales secretary	Mrs Annette Binding	**Records Secretary**	Mr Rex Johnson
Publications Editor	Dr Roger Key	**External Representitives**	Mrs Jane Ostler Mr Ken Rowland
Executive Committee	Mr Mark Crick, Mrs Annette Faulkner, Mr Graham Weaver. Mr Ken Rowland		
Development Group	Dave Bromwich, Annette Faulkner, Roger Key & Phil Porter		

Section Recorders

Geology	Mr David Robinson
Bryophytes/Lichens	Prof. Mark Seaward
Fungi	Mr Ken Rowland
Higher plants	Mrs Irene Weston & Mr Marson Peet
Molluscs	Mrs Vi Wilkin (N), Mr John Redshaw (S)
Spiders	Mrs Annette Binding
Isopods& Myriapods	Mr Neil Pike
Dragonflies	Mr John Redshaw
Shield bugs	Mrs Annette Binding
Butterflies	Mr Allan Binding
Moths	Mr Rex Johnson
Flies	Mr Andrew Godfrey & Mrs Jillian Mears
Beetles	Dr Roger Key
Sawflies	Dr David Sheppard
Ants, wasps & bees	Dr Michael Archer
Birds	Mr Jim Rance
Mammals & Herptiles	Miss Norah Goom
Bats	Mrs Annette Faulkner

Secretary's Report, 1998 - Dave Bromwich

Co-operation with the Lincolnshire Trust for Nature Conservation has proved very helpful and cost-effective in the development of the Union's administration. Streamlined administration of membership with the introduction of Direct Debit and a whole range of administrative support had improved the lot of the honorary officers. The Executive are keen to pursue the excellent working relationship with the Trust.

The natural history collections and library continued to exercise the minds of the Executive Committee. The Lincolnshire Trust offered a secure home for the more exceptional books within the library. Access had been gained to elements of the natural history collection in Rumbold Street, although progress is still slow. Major debates are raging in the city over the location of the new museum, which will have a considerable bearing on the fate of the natural history collections. This is also inextricably linked in with the development of a National Biological Network and a Local Records Centre for Lincolnshire, in which the LNU will play a central role.

Our Internet site is now generating new contacts and we have had enquiries about membership, publications and species. Two queries worthy of comment were from Dr Judson from the Natural History Museum in Paris, enquiring about past president (1927) H. Wallis Kew, and from Dr Wynne from Rothamstead for information on the distribution of the hoverfly *Portevinia maculata* and its foodplant ramsons *Allium ursinum* in the county.

With the administration of the LNU now less burdensome. the Executive Committee feels that the time is right to increase promotion of the LNU. A new membership leaflet is being developed and we intend to promote the publications a bit harder as we are sitting on an ever-ageing stock. We hope to be able to clear the decks somewhat to make way for some new titles and updates. Modern technology means we can produce smaller print runs and hopefully try and keep them more up to date.

Lincolnshire Naturalists' Union Summer Meetings - 1998

Lilley's Carr & Friskney Decoy Wood N.R. Sunday April 19th

At Lilley's Carr it was good to see so much alternate golden saxifrage *Chrysosplenium alternifolium* and vast quantities of butterbur *Petasites hybridus,* always a feature of the reserve. Also, greater chickweed *Stellaria neglecta* which was new. Somewhat of a surprise was a specimen of the crown imperial *Fritillaria imperialis*, a yellow specimen in full flower, presumably from garden refuse. At Friskney Decoy Mr Alec Parker, the Trust warden guided the party. There was a great deal of white climbing fumitory *Corydalis claviculata* in the woodland, which contains two enormous sycamores which should be measured and recorded. Two native black poplars *Populus nigra* var *betulifolia* had also been planted on the reserve but both have since died. A huge thunderstorm made an abrupt ending to the meeting inevitable.

Crown imperial among the nettles at Lilley's Carr
photo Roger Key

Twyford Wood. Saturday May 16th. Joint meeting with Lincolnshire Branch of Butterfly Conservation.

Through the good offices of the Forestry Commission, the party was able to drive a long way into the woodland, a mixture of conifers and broad-leaves. In common with some other plantations in the county, Twyford Forest is planted on a disused airfield and the clearings in the trees are frequently on shallow soils subject to drought.

The plant community therefore contained such elements as white stonecrop *Sedum album*, field madder *Sherardia arvensis*, spring whitlow grass *Erophila verna*, changing forget-me-not *Myosotis discolor* and cut-leafed cranesbill *Geranium dissectum*. Thirty young plants of the bee orchids *Ophrys apifera* were also found in this low-competition turf. Other clearings were more lush and glaucous sedge *Carex flacca*, wild strawberry *Fragaria vesca*, meadow vetchling *Lathyrus pratensis* pendulous sedge *Carex pendula* and lesser knapweed *Centaurea nigra* occurred and wood vetch *Vicia sylvatica* was also found. The butterflies were the stars. Both the grizzled *Pyrgus malvae* (page 254) and the dingy skipper *Erynnis tages* could be seen in small numbers in the sunny clearings, making this site a very important county asset. Some common birds were singing including willow warbler *Phylloscopus trochilus*, garden warbler *Sylvia borin*, cuckoo *Cuculus canorus* and goldcrest *Regulus regulus*.

LNU members at Twyford
photo Rene Weston

Thurlby Fen Slipe NR. Pinchbeck Fen Slipe NR & Fossdyke Bank Saturday June 27th. Joint meeting with the Botanical Society of the British Isles.

Unfortunately this meeting was not well attended by LNU members. Richard and Kay Heath, the Trust managers, had prepared a very well defined path through Thurlby Fen Slipe and some notable water plants included lesser water parsnip *Berula erecta*, greater water parsnip

Sium latifolium, water violet *Hottonia palustris*, lesser water plantain *Baldellia ranunculoides* and greater spearwort *Ranunculus lingua.* Fen pondweed *Potamogeton coloratus* was a plant much appreciated by B.S.B.I. members.

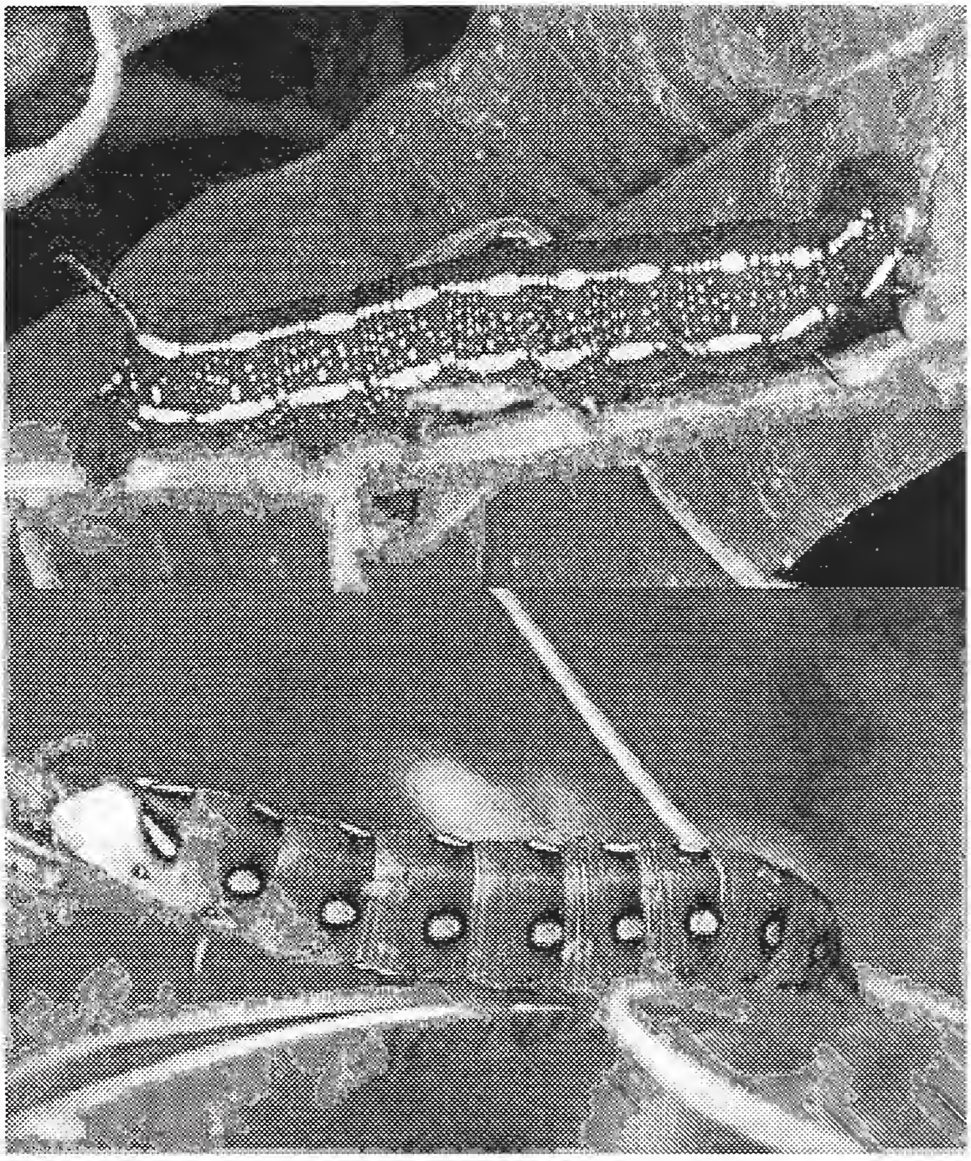
The afternoon meeting at Pinchbeck Fen Slipe NR was led by John Redshaw and notable were the large stands of lesser reedmace, *Typha angustifolia*, alongside a smaller population of greater reedmace *Typha latifolia* and some hybrid plants were found. Finally, the spectacle of 4000 pyramidal orchids *Anacamptis pyramidalis* at Fossdyke Bank ensured a fitting finale to an interesting day and quaking grass, lady's bedstraw, mallow and poppies added to the variety of plants.

Kingerby Beck Meadows NR. Sunday July 12th.

This meeting suffered from the midsummer holiday syndrome and the attendance was very low. However, the meadows were full of flowers and, although the frog orchid *Coeloglossum viride* could not be found (it was found later in the year), Zella Harris was able to locate adder's tongue *Ophioglossum vulgatum* as compensation. Yellow rattle *Rhinanthus minor* in abundance showed that the management of the meadows is succeeding in maintaining its status. Lady's bedstraw *Galium verum*, purging flax *Linum catharticum*, meadow vetchling *Lathyrus pratensis,* catsear *Hypochoeris radicata* and tufted vetch *Vicia cracca* and other common plants were prominent.

Laughton Forest. Sunday August 16th.

The Forestry Commission invited the LNU to survey their heathland restoration and clear fell areas and the party was accompanied by the chief forester, Andrew Powers. Rose's Plantation was a mixture of pools and recently cleared ground with a dense growth of the coarse plants which colonise such areas before the new character can be established. In the meantime, they attract a wide range of insects: emerald damselfly *Lestes sponsa*, ruddy darter *Sympetrum sanguineum* and the new flea beetle *Epitrix pubescens* on the bittersweet *Solanum dulcamara.* The pools had marsh cinquefoil *Potentilla palustris* and amphibious bistort *Polygonum amphibium* and the latter plant was hosting a gall midge, provisionally identified in the available literature as *Wachtiella persicariae*, in thickened leaf margins.



Bedstraw hawk moth larva from Laughton - upper photo early instar, lower photo final instar

photos Roger Key & Rex Johnson

The clear-fell area was bordered by tracks with deep wheel-ruts and these held round-leafed sundew *Drosera rotundifolia*. The tree stumps yielded larvae of the large red-belted clearwing moth *Synanthedon culiciformis* in birch, and the longhorn beetle *Anoplodera rubra* in pine, the first records of either species for decades. Boggy areas along the rides held interesting plants including bog pimpernel *Anagallis tenella*. During our search through this area, Andrew Powers mentioned that in the early days of the plantation, one of the pest species was black grouse *Tetrao tetrix*, now long extinct in the county, which fed on conifer shoot tips.

The final site contained extensive areas of bog myrtle *Myrica gale* in a very wet section of the forest, bordered by sandy banks. These banks had an amazingly dense colony of larval tunnels of the green tiger beetle *Cicindela campestris.* Two interesting moths were captured, an adult Archer's dart *Agrotis vestigialis* and a larval bedstraw hawk moth *Hyles galii* on rose-bay willow-herb *Chamaenerion angustifolium*. The latter was raised at Whisby Nature Park (plate 16). It has been found in the Laughton area for three years now.

Linwood Warren NR. Sunday September 13th.
Brian Oxborrow led the party on the reserve. He explained the site management, including the sheep grazing regime, water level manipulation and species protection plots including the marsh gentian *Gentiana pneumonanthe* reintroduction area, the heathland regeneration and the slow worm *Anguis fragilis* habitat, where one specimen was seen. One of the highlights of Linwood is the reindeer moss, a remnant of glacial vegetation. The hard fern *Blechnum spicant* was also noted together with the three heathers *Erica tetralix, E. cinerea* and *Calluna vulgaris*, creeping willow *Salix repens*, mat grass *Nardus stricta* and cotton grass *Eriophorum angustifolium*. Many of the extensive list of sedges had unfortunately been 'topped' by the Hebridean sheep which made identification impossible in many cases, but green-ribbed sedge *Carex binervis* and yellow sedge *Carex viridula* ssp. *oedocarpa* were recorded. A regrettable find was New Zealand pygmeyweed *Crassula helmsii,* which can supplant other aquatic vegetation, in the far pond. Elimination of this very invasive alien aquatic plant is extremely difficult.

Among the insects, large ground beetles *Carabus problematicus* were found and among the few hoverflies in sheltered areas was the large black and white species *Scaeva pyrastri*. Speckled wood *Pararge aegeria* and red admiral *Vanessa atalanta* butterflies also put in an appearance. Among the moth larvae on view was a fully grown buff-tip *Phalera bucephala*. 74 species of fungi were identified including 16 new site records.

Broughton Woods Sunday 18th October. The L.N.U. Fungus Foray.
See the fungus foray report on page 248.

Indoor meetings of the LNU in 1998

17th Jan Sat	Recorder's Meeting	LNU Recorders
19th Feb Thurs	Christine Godfrey Memorial Lecture. “Mountain Flowers, Home & Away”	Rene Weston
21st Mar Sat	Presidential Address“Wildlife in Lincoln.” & AGM	Phil Porter
18th Nov Thurs	Christine Godfrey Memorial Lecture. “Life in the Darkness.” Wildlife of the old mines of Derbyshire.	John James
19th Dec Sat	Christmas Miscellany	

Contributing to "The Lincolnshire Naturalist"

We are constantly on the lookout for full length articles or short notes, even of just a few lines, on any aspect of Lincolnshire's natural history, current or historic. Consider a note in The Lincolnshire Naturalist for any new or significant observations.

Articles should be typed. It would help the editor *tremendously* if they could either be e-mailed or sent on a 3½" computer disk with accompanying paper copy, in just about any word processor format (although don't let this put you off sending in an article) and in the format described here. Adding an ASCII text file in addition to the word processed file will ensure that it can be incorporated directly. Most word processors can also output in ASCII.

Drawings, black & white photographs, colour transparencies or negatives (please include a print) can be included. Colour illustration may be rendered to black & white. Please give a caption. Illustrations will be returned and edited text resubmitted to the author for approval and proof-reading before publication.

Names - Latin names should be *italicised*, **not** (bracketed) nor underlined and should follow the English name (where applicable) with no separating comma. English names should start with lower case letters unless incorporating other names warranting capitalization (eg Brandt's bat). References to journals and books should be as below. Pease note and use the capitalization and italic convention.

WOODRUFFE-PEACOCK, Rev E.A., 1900. The Lincolnshire Naturalist's at Freiston. *The Naturalist*, **25**: 141-144.
DUDDINGTON, J. & JOHNSON, R. 1983. *The Butterflies and Larger Moths of Lincolnshire and South Humberside.* Lincolnshire Naturalists' Union. Lincoln. 299pp.

The final copy date is **31st March** of the year in which the journal is to be issued. Please contact the editor directly if there is difficulty in meeting this deadline. If in any doubt as to whether your observation merits a note or an article, or you have any other queries please do get in touch with the editor Dr Roger Key, 67 Peterborough Road, Crowland, Lincs, PE6 0BB, tel 01723 210541, to whom texts should be sent. A more comprehensive guidance note for potential and existing authors is available on request.

Editorial

Roger Key

This issue of "The Lincolnshire Naturalist" concludes the first volume in the new, colour format, a total of 272 pages of papers, notes and contributions from naturalists both from Lincolnshire and from elsewhere but writing about Lincolnshire. Now, at the eve of volume 25 (and, I suppose, at the eve of the Millennium), might be another option for further change to our journal. The question is, should there be more change and, if so, what should that change be?

Perhaps a change of format from A5 to a larger, but probably thinner issue, might be popular, perhaps similar in size to *British Widlife*. Is the use of colour plates justified and should the eight pages with colour be bunched in the middle or spread throughout the journal? Would a change to glossy paper, with an increase in quality of reproduction of photos be justified? The content and editorial style could also be changed. Should the journal be more or less formally scientific than it is at the moment, or is the mix just about right? Are there subject areas that are under-represented? (and would you be willing to write an article to fill the gap?). Has the time come to commission binders for our journal, and should we put effort into marketing the journal more widely than just to LNU members, to spread our results more widely and perhaps generate more income for the our work? If you have ideas or comments, please get in touch.

THE LINCOLNSHIRE NATURALIST

including
Transactions of the Lincolnshire Naturalists' Union
for 1998
Volume 24, Part 4, 1999

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cover photograph - Gibraltar Point Nature Reserve from the air - photo by G.M. Gray